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United States  
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of Agriculture



Forest Service  
Tongass National Forest

**Alaska  
Region**

R10-MB-429

**FINAL  
EIS**  
ENVIRONMENTAL  
IMPACT  
STATEMENT  
and  
RECORD of DECISION

**MADAN  
TIMBER SALE**  
Tongass National Forest



July 2003





United States  
Department of  
Agriculture

Forest  
Service

Alaska Region  
Tongass National Forest

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File Code: 1950

Date: July 31, 2003

Dear Reader

Attached is the Record of Decision (ROD) and the Final Environmental Impact Statement for the Madan Timber Sale on the Tongass National Forest.

Additional copies of the Final EIS are available for review at Forest Service District Offices in southeast Alaska. Copies have also been sent to libraries throughout southeast Alaska.

The ROD documents my final decision on the Selected Alternative, and the factors considered in reaching this decision. The effective date of implementation for the decision and Notice of Rights of Appeal are also specified in the ROD.

I want to thank those of you who took the time to review and comment on the Draft Environmental Impact Statement. Your interest in the management of the Tongass National Forest is appreciated.

As the Forest Supervisor, I am responsible for this decision. Please direct any correspondence or requests for additional copies to Chip Weber, District Ranger, P.O. Box 51, Wrangell, AK 99929; or to the e-mail address: [cweber@fs.fed.us](mailto:cweber@fs.fed.us); or call (907) 874-2323.

Sincerely,

THOMAS PUCHLERZ  
Forest Supervisor





# **RECORD OF DECISION**



## ***Record of Decision***

### **Madan Timber Sale**

**USDA Forest Service  
Wrangell Ranger District, Tongass National Forest  
Wrangell, Alaska**

## **Introduction**

This Record of Decision (ROD) documents my decision to select a modified Alternative 2 from the Madan Timber Sale Final Environmental Impact Statement (Final EIS). The Madan Project Area is located on the mainland, south of Virginia Lake and north of Berg Bay approximately 8 miles southeast of Wrangell, Alaska. This Decision includes the specific location and design of timber harvest units and roads, protection requirements for harvesting timber, and construction of associated log transfer facilities at Moose Creek and Jenkins Cove. The timber may be sold in one sale or several sales of varying sizes. In addition, this Decision includes the implementation of road management objectives such as road maintenance level and road storage. This Decision also makes a determination regarding a non-significant Forest Plan amendment to adjust the size and configuration of the Virginia Lake and Madan Old-Growth Reserves (OGRs).

## **Background**

The Madan Project area is entirely within an inventoried roadless area on the Tongass National Forest. Due to recent decisions and litigation, several changes in the Forest Service direction occurred between the Draft EIS and Final EIS, as follows.

- Modifications were made throughout the document to make the project consistent with the 1997 Record of Decision for the Tongass National Forest Land and Resource Management Plan (Forest Plan). At the time of the Draft EIS publication, the 1999 Record of Decision for the Forest Plan was in effect. In *AFA v. USDA* (J99-0013 CV [JKS]), the U.S. District Court, District of Alaska vacated the 1999 Record of Decision for the Tongass Forest Plan and upheld the 1997 Record of Decision. The Madan project is consistent with the 1997 Forest Plan Record of Decision.
- Currently, the Roadless Area Conservation Rule applies to the Tongass National Forest. This rule generally prohibits timber harvest and road building. The rule adopts mitigation measures to assure a smooth transition for forest dependent communities in Southeast Alaska. The final rule provides that prohibitions do not apply to the Tongass National Forest where a notice of availability for a draft environmental impact statement (for timber harvest or road building in an inventoried roadless area) has been published in the Federal Register prior to January 12, 2001. The notice of availability for the Madan Timber Sale draft environmental impact statement was published on June 23, 2000, so this project may proceed pursuant to 36 CFR 294.14(d).



### Purpose and Need

The purpose and need for this project is to respond to goals and objectives identified by the Forest Plan for the timber resource, while moving the project area toward the desired future condition for all resources. The Forest Plan identified the following goals and objectives, which are applicable to the Madan project:

- Manage the Tongass timber resource for production of sawtimber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner.
- Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the demand for the planning cycle.
- Recognize the scenic values of suitable timber lands viewed from selected popular roads, trails, water travel routes, recreation sites, bays and anchorages, and to modify timber harvest practices accordingly.
- Maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs.
- Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
- Support a wide range of natural resource employment opportunities within Southeast Alaska communities.
- Maintain a Forest-wide system of old-growth forest habitat to sustain old-growth associated species, and ensure that the reserve system meets the minimum size, spacing and composition criteria in Appendix K of the Forest Plan.

Appendix A of the Final EIS provides a more detailed rationale for why the Madan Project Area was selected for analysis at this time. Further clarification can be found in the next section regarding this project's relationship to the Forest Plan.

Section 101 of the Tongass Timber Reform Act of 1990 (TTRA) directs the USDA Forest Service

“...to the extent consistent with providing for multiple use sustain yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle.”

Section 101 of TTRA specifies that Forest Service efforts to seek to meet market demand are subject to appropriations, National Forest Management Act requirements, and other applicable laws. Providing a timber supply from the Tongass for sustained local wood products, industry employment, and related economic and social benefits, helps meet the Forest Plan objective of supporting a wide range of natural resource employment opportunities within Southeast Alaska's communities.

### Decision

It is my decision to choose Alternative 2, with modifications that incorporate some of the design features of Alternative 3, as the Selected Alternative for implementation in the Madan Project Area. The Selected Alternative is based on a thorough review of the project analysis and on agency and



public comments received in response to the Draft EIS. The changes detailed below are specifically incorporated into the final decision. Because the Selected Alternative modifies Alternative 2 while incorporating design features of Alternative 3, the environmental effects and resource outputs generally fall within the range of values shown in the Final EIS for those two alternatives. I authorize the required actions to implement this decision.

My specific modifications of Alternative 2 produce the following unit and road management changes to provide additional resource protection in response to public and agency input received on the Draft EIS.

### Area Northeast of Gypsy Creek (including the Virginia Lake area)

- Units V-78, V-97, V-111 and V-112, which were in Alternative 2, are not included in the Selected Alternative. I have left these units out of the Selected Alternative in response to public comments concerned with maintaining the visual integrity of the area around Virginia Lake, especially the view from the Virginia Lake Recreation Cabin. My intention is to defer harvest in this area for the immediate term while we continue to implement similar high-retention prescriptions in other areas of this project and on other projects within the forest. Deferring treatment of these units further protects the known karst features that exist in them.
- I have made several changes to unit prescriptions and road management in the area northeast of Gypsy Creek to retain the integrity of the wildlife corridor between Mill Creek and Glacier Creek, which connects low elevation forests and watersheds with the Virginia Lake Old-Growth Reserve.
  - Units V-61 and V-64 are included in the Selected Alternative, but the harvest prescription is changed from Clearcut with 10 percent Retention to Individual/Group Selection with 70 percent retention.
  - Unit V-71 is included in the Selected Alternative, but the prescription is changed from Clearcut with 10 percent retention to Patch Cut with 60 percent retention.
  - The mainline roads heading north and east beyond Gypsy Creek (Roads 10 and 1050) will be physically and administratively closed to all motorized vehicles and placed into storage following completion of the timber sale. Because Road 1050 is a classified road and is vital for future entries, only critical stream-crossing structures will be removed. Other structures, which are determined to be low maintenance structures, will remain. Once management activities are concluded, this will provide for walk-in access only beyond Gypsy Creek.
  - Roads 1000-300, 1000-500, and 1050-200 will be constructed as temporary spur roads and will be closed and allowed to revegetate following their use.

### Gypsy Creek to Madan Bay Area (including the Jenkins Cove area)

- In order to balance economic concerns with visual and wildlife concerns, instead of following Alternative 2 in the Jenkins Cove area between Gypsy Creek and Madan Bay, the Selected Alternative will include the units and roads from Alternative 3 with the following modifications:
  - Road 1020 will be built into Unit J-30 and along the upper slope of Unit J-31 to improve the economics of helicopter yarding adjacent units.
  - Unit J-30 will be cable harvested using a clearcut with 10 percent retention prescription as presented in Alternative 2.

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- Unit J-31 will be cable harvested using an individual/group selection with 70 percent retention prescription. The 1020 Road will be moved uphill, which will make it feasible to use cable yarding with a high retention prescription.

### Moose Creek Area

- To sustain wildlife corridor functions, the Moose Creek area will be managed as presented in Alternative 2 with the following modifications:
  - Units M-140 and M-148 will be changed from cable clearcut with 10 percent retention to helicopter harvest using individual/group selection with 70 percent retention.
  - Road 2010 and the temporary spur road into Unit M-140 will not be built. Volume harvested from Units M-140, M-148 and M-150 will be yarded by helicopter to landings along the mainline Moose Creek Road (Road 20). This further protects the known karst feature that exists adjacent to the Road 2010 location.

## Description of the Selected Alternative:

- 1) The Selected Alternative will harvest timber from approximately 2,118 acres in the project area. This harvest will provide an estimated 27 million board feet (MMBF) of sawlog and utility volume based on stand examination estimates of unit volume. Actual cruised volume may vary. Design features, estimated acres, and estimated volumes of the selected harvest units are summarized in the ROD unit summary table (Table ROD-1) and described in detail on the Unit Cards in Appendix 2.
- 2) The Selected Alternative includes a mix of silvicultural prescriptions (Table ROD-2). Approximately 73 percent of the harvest unit acreage includes prescriptions other than clearcutting. The clearcut prescription includes a 10 percent reserve tree requirement and the other prescriptions have requirements ranging from 60 to 70 percent.
- 3) New Log Transfer Facilities (LTFs) and Sort Yards will be constructed at both Jenkins Cove and Moose Creek to transfer logs directly to barges or into the water for rafting. Following harvest activities, the floating portion of the LTFs will be removed.
- 4) The Selected Alternative includes 18.8 miles of new classified and temporary road construction in the Madan Project Area (note that road mileages reported in this section are ground lengths, which are usually higher than road lengths measured using GIS; the total GIS road mileage in the Selected Alternative is 17.7 miles). During analysis we considered two options for long-term management of the Madan road system. Option A analyzed keeping almost all roads (14.9 miles) open in a stormproof condition for administrative and incidental uses. Option B analyzed closing all roads to vehicle traffic by gating and stormproofing 14.9 miles of roads and placing the remaining roads into storage by removing drainage structures and installing water bars. I have chosen a mix of the two options by building some roads as temporary spurs, closing some classified roads and keeping others open in a stormproof condition.

Table ROD-1.

**ROD Unit Summary Table**

Unit	Acres	Harvest Method	Prescription	Total Vol. (MBF)	Harvest Vol. (MBF)
<b>Area Northeast of Gypsy Creek</b>					
V-56	9	Cable	CC w/10% Reserves	293	263
V-57	30	Cable	CC w/10% Reserves	997	898
V-61	36	Cable	ITM/Group Select -70% Retention	627	157
V-64	16	Cable	ITM/Group Select - 70% Retention	480	120
V-71	22	Cable	Patch Cuts - 60% Retention	571	171
V-83	94	Cable	CC w/10% Reserves	3,609	3,247
V-93	35	Helicopter	CC w/10% Reserves	1,502	1,352
<b>Gypsy Creek to Madan Bay Area</b>					
J-1	39	Cable	CC w/10% Reserves	694	625
J-4	15	Helicopter	ITM Group Select -70% Retention	264	66
J-5	37	Cable	CC w/10% Reserves	677	609
J-10	21	Cable	CC w/10% Reserves	613	551
J-13	63	Cable	CC w/10% Reserves	1,762	1,586
J-30	21	Cable	CC w/10% Reserves	265	239
J-31	111	Cable	ITM/Group Select -70% Retention	941	235
J-32	217	Helicopter	ITM/Group Select -70% Retention	7,382	1,846
J-37	34	Helicopter	ITM/Group Select -70% Retention	1,142	286
J-42	192	Helicopter	ITM/Group Select -70% Retention	8,686	2,171
J-49	21	Cable	CC w/10% Reserves	398	357
J-50	14	Helicopter	ITM/Group Select -70% Retention	285	71
J-52	42	Helicopter	ITM/Group Select -70% Retention	866	217
J-53	44	Cable	CC w/10% Reserves	1,310	1,178
J-201	243	Helicopter	ITM/Group Select -70% Retention	4,414	1,104
J-202	55	Helicopter	ITM/Group Select -70% Retention	993	248
J-203	65	Helicopter	ITM/Group Select -70% Retention	2,937	734
J-204	42	Helicopter	ITM/Group Select -70% Retention	1,890	473



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Table ROD-1.

**ROD Unit Summary Table (Continued)**

**Moose Creek Area**

M-117	13	Cable	CC w/10% Reserves	335	302
M-119	60	Cable	CC w/10% Reserves	1,003	903
M-123	83	Cable	CC w/10% Reserves	2,950	2,654
M-127	125	Helicopter	Patch Cuts 60% Retention	3,953	1,186
M-128	24	Helicopter	Patch Cuts 60% Retention	718	215
M-135	24	Helicopter	Group Select - 70% Retention	615	154
M-140	43	Helicopter	ITM/Group Select - 70% Retention	1,096	274
M-148	83	Helicopter	ITM/Group Select - 70% Retention	2,683	671
M-150	30	Helicopter	Group Select - 70% Retention	808	202
M-156	81	Helicopter	Patch Cuts - 60% Retention	2,702	811
M-161	34	Helicopter	Patch Cuts - 60% Retention	1,347	404
<b>TOTAL 2,118</b>				<b>61,808 MBF</b> <b>(123,616 CCF)</b>	<b>26,581 MBF<sup>1/</sup></b> <b>(53,162 CCF)</b>

<sup>1/</sup> This volume assumes removal down to a 6 inch top diameter.

Table ROD-2.

**Silvicultural Prescriptions in the Selected Alternative<sup>1</sup>**

<b>Silvicultural Prescription</b>	<b>Acres</b>	<b>% Unit Acres</b>	<b>Est. Harvest Volume (MBF<sup>2,3</sup>)</b>	<b>% Harvest Volume (MBF<sup>2</sup>)</b>
Clearcut, retain 10%	570	27%	14,800	56%
Patch Cut, retain 60%	286	14%	2,800	11%
Group Selection, retain 70%	54	3%	400	2%
Individual/Group Selection, retain 70%	1,208	57%	8,700	33%
<b>TOTAL</b>	<b>2,118</b>	<b>100%</b>	<b>26,600</b>	<b>100%</b>

<sup>1/</sup> Numbers may not sum to the total exactly due to rounding.

<sup>2/</sup> One MBF is one thousand board feet of timber.

<sup>3/</sup> Volume numbers are rounded to the nearest hundred MBF.

When logging is complete, a total of 9.5 miles of classified road will remain open in a stormproof condition as follows:

- Road 10 from Jenkins Cove to Gypsy Creek (2.7 miles),
- Road 1010, which heads south from Road 10 toward Madan Bay and accesses Units J-5, J-10 and J-13 (2.1 miles),
- Road 1020 to milepost (MP) 1.75, which accesses Units J-30 and J-31 (1.8 miles), and
- Road 20, which is the mainline road in the Moose Creek drainage (2.9 miles).

A total of 4 miles of classified road will be placed in storage as follows:

- Road 10, from Gypsy Creek to the start of Road 1050, will be built as a classified road and put into storage following use (2.3 miles) and
- Road 1050, from Road 10 to the end of the road in Unit V-83, will be built as a classified road and put into storage following use (1.7 miles).

The following roads will be built as temporary roads and closed following use (5.3 miles total):

- Road 1000-300, which accesses Units V-56 and V-57 (0.8 mile),
- Road 1000-500, which accesses Unit V-71 (0.5 mile),
- Road 1050-200 and other short roads that access Unit V-83 (0.5 mile),
- Roads 1010-200, 1010-210 and other short roads that access Unit J-13 (1.8 miles),
- The last segment of Road 1020, which accesses Unit J-31 (0.3 mile),
- The short road that accesses Unit J-53 (0.6 mile),
- The short roads that access Unit J-5 (0.6 mile), and
- The short road that accesses Unit M-119 (0.2 mile).

Appendix 3 of the ROD contains the Road Cards, with direction for the location of each classified road. The Road Cards list road segments, site-specific design criteria, and road management and access objectives for future management of the transportation system, including maintenance and closures.

- 5) The Selected Alternative includes mitigation measures and design elements to reduce or eliminate adverse environmental effects of timber harvest and road construction as specified in the unit and road cards. The ROD adopts the implementation and effectiveness monitoring planned to determine how well resource management objectives have been met (FEIS App G).
- 6) My decision includes a non-significant Forest Plan amendment to adjust the boundaries of two small OGRs in Value Comparison Units (VCUs) 502 and 504. See Appendix 1 of this ROD for more details. This decision reflects the recommendations of an interagency group of biologists from the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Forest Service, as well as comments from the public.

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- 7) I have determined that the effects of the Selected Alternative on the subsistence use of resources in the Madan Project Area are minimal. The direct effects from the action alternatives in the Madan Project Area do not present a significant possibility of a significant restriction of subsistence uses of wildlife, fish and shellfish, marine mammals, other foods, or timber resources. The potential foreseeable and cumulative effects from implementing the Forest Plan through the entire rotation period, including the no-action and action alternatives in the Madan Project Area, do not present a significant possibility of a significant restriction of subsistence uses of deer, wolf and other resources (see FEIS, Subsistence section) in the project area. Our analyses showed no impacts would cross any concern threshold such as the cumulative 20 percent in the deer habitat model. While not required, a subsistence hearing was held for this project. No one expressed concerns about subsistence use of the Madan area during the public hearing. Further, implementation of the Forest Plan in the first 5 years has been much less than what was estimated, so the cumulative impacts to subsistence users in the Wrangell and Petersburg areas have also been less. Mitigation measures such as post-harvest access restrictions for minimization of impacts to subsistence resources suggested through agency and public scoping have been incorporated into the Selected Alternative.

## Reasons for the Decision

I have carefully considered the timing of this decision in view of ongoing changes in agency regulations and pending litigation. While I appreciate and understand the comments advising to delay this decision until such time as greater certainty exists regarding roadless area management and other current events, the need to complete analyses in a timely manner is compelling. Some of the factors I considered in making the decision to move forward at this time include:

- The Forest Plan allows for the activities approved by this decision to take place.
- The repercussions of delaying decisions regarding road building and timber harvest, even for a relatively short period, have a significant effect on the amount of timber available for sale in subsequent years, due to the time needed for sale preparation activities, appraisal and advertisement.
- Delayed decisions affect other decisions “in line” for consideration, creating ongoing impacts to the entire sale program several years into the future.
- As stated earlier, the Tongass National Forest continues to operate under the direction contained in Section 101 of the Tongass Timber Reform Act of 1990 (TTRA) (Forest Plan ROD, page 37). The Tongass National Forest has received special funding to ensure it will be able to meet this objective within the direction and requirements of the Forest Plan.
- The Selected Alternative includes little effect on the approximately 69,700 acres in the Madan Inventoried Roadless Area. Over 90 percent of the Madan Roadless Area will remain roadless following completion of the Madan project. Approximately 2,118 acres (3 percent) within the roadless area will be treated, mostly with partial harvest. Approximately 570 acres will be clearcut with 10 percent retention and the remaining harvested acres will be patch cut or selective harvested with either 60 percent or 70 percent retention. There are 18.8 miles of road development within the project area (based on ground miles). Of this, 5.3 miles are temporary roads and the



remainder are classified (permanent) roads. Upon completion of the sale, 9.5 miles will remain open in a stormproofed condition and the remainder will be either decommissioned or placed in storage.

- The special provision at 36 CFR 294.14(d) of the Roadless Area Conservation Rule allows the Madan Timber Sale to move forward and is necessary because of the unique social and economic conditions where a disproportionate share of the impacts are experienced throughout the entire Southeast Alaska region and concentrated most heavily in a few communities like Wrangell.
- None of the alternatives for the Madan project result in a positive economic timber harvest as presented. Numerous factors affect the economic viability of every timber sale, including current market conditions, cost of yarding method, and quality of wood in the project area. Management decisions (such as deferring one or more expensive helicopter units or changing the utilization requirements for wood to be removed) made at the time a sale is offered can have significant effects on the value of a sale. For example, the Selected Alternative, without any sale adjustments, had a projected value of -\$55.80/hundred cubic feet (CCF) under 2002 market conditions using the June 2002 NEPA Economic Analysis Tool (NEAT) data. Adjusting utilization standards improves the economics by \$14/CCF (See Issue 2 discussion in the ROD and FEIS Chapter 3). Based on these findings, I believe that appropriate sale cost adjustments can be implemented at the time of sale offering to result in a profitable timber sale project.

Furthermore, I have considered the following:

- 1) In making my decision, I considered the many issues raised during the development and scoping of this project, Forest Plan and Record of Decision standards and guidelines for the project area, and took into account competing interests and values of the public. Many divergent public and agency opinions were expressed during the analysis. Though my decision will probably not please all who commented, their comments have helped make this a better decision. I have considered all views that have been expressed, utilized input where feasible and consistent with the purpose and need of the project, and feel that my decision is reasonable. The Selected Alternative provides a beneficial mix of resources for the public within the framework of existing laws, regulations, policies, public needs and desires, and capabilities of the land, while meeting the stated purpose and need for this project.
- 2) My decision to implement this Selected Alternative conforms to the Forest Plan and the principles of sound National Forest management. I have considered the need to help provide a sustained level of timber supply to meet annual and Forest Plan planning cycle market demand, and to provide diverse opportunities for natural resource employment, consistent with multiple use and sustained yield of all renewable forest resources. The Madan timber sale project will help meet Southeast Alaska timber supply needs.
- 3) Distinctive characteristics of the landscape setting for this project affected my decision. Only a very small portion of this landscape has been or is likely to be subject to development or disturbance such as timber harvest. At the largest scale, only a small portion of the Tongass is subject to disturbance under the Forest Plan. The large-scale landscape around the Madan Project Area includes the Stikine LeConte Wilderness to the north, Misty Fiord National Monument to the south, and a large area of Semi-remote and Remote Recreation Land Use Designations that is

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protected from human disturbance. Modified old-growth reserves and Forest Plan standards and guidelines for beach fringe, karst and riparian protection result in a substantial portion of the Madan Project Area being restricted from development.

- 4) In the Selected Alternative, I have amended the Forest Plan to adjust the boundaries of the small old-growth reserves in Value Comparison Units (VCU) 502 and 504. The modified old-growth reserves protect 7,780 acres of habitat within the Madan Project Area, including 6,020 acres of high quality old-growth forest in the areas of Virginia Lake and Madan Bay. The modified reserves incorporate important goshawk, deer and bear habitat, and were recommended by all agency biologists working on the project.
- 5) I have chosen to construct a substantial portion of the complete road network for the Madan Project Area at this time. Based on analysis in the Final EIS, I feel it is important to the economics of the project to build the segments of road identified in the Selected Alternative. I also feel that closing some of these new roads to motorized access following the sale is responsive to concerns for wildlife and water quality. The Selected Alternative allows construction of 13.5 miles of classified (specified) road and 5.3 miles of temporary road (based on ground miles). Following timber harvest, all of the temporary roads will have all drainage structures removed and waterbars installed to return natural drainage patterns. The classified roads north of Gypsy Creek will be physically closed to vehicle traffic and placed in storage by removing critical drainage structures and installing waterbars where necessary. The roads that remain open to vehicle traffic (9.5 miles) will be stormproofed by outsloping the road surface and providing driveable waterbars and rolling dips, while keeping drainage structures in place.
- 6) Roads and their associated use were a common issue or concern in public and agency comments we received on the Draft EIS and in response to scoping. Motorized access will be prohibited by Forest Order on the roads placed in storage. With the road management option selected by this decision, a compromise was reached by not allowing motorized access north of Gypsy Creek, to reduce wildlife disturbance in summer and fall while allowing access into the Jenkins Cove and Moose Creek areas. Managing the road in the Madan area in this fashion will allow the significant economic advantage of cable logging in mostly unseen areas and shortened yarding distances for helicopter units.
- 7) The Selected Alternative defers harvest in units that are directly viewed from Virginia Lake, yet still allows partial harvest in other seen areas. I believe this approach allows time for the agency and the public to gain comfort with partial harvest effects in sensitive viewsheds.
- 8) The Selected Alternative utilizes both even-aged and uneven-aged harvest prescriptions, with 73 percent of the treated acres having retention of 60-70 percent of their stand structure. The prescriptions chosen are based on a unit-by-unit consideration of many factors, which are described in Chapter 3 of the Final EIS and in the ROD Unit Cards. The Selected Alternative uses a combination of cable and helicopter harvest, with logs trucked to new LTFs and sort yards at Jenkins Cove and Moose Creek. The terrain in the project area allows for relatively low impact road construction that is highly compatible with cable yarding and significantly reduces helicopter yarding distances. Significant adverse effects to soils, water, or fisheries are not anticipated due to the road and unit locations in the Selected Alternative.



- 9) The Selected Alternative is responsive to wildlife travel corridor concerns in both the Moose Creek and Gypsy Creek areas, while still allowing some timber harvest in these areas. I have chosen to include harvest of Units M-140 and M-148 in the Moose Creek area, with a major change to the harvest prescription from clearcut to individual/group selection with 70 percent retention. I have also chosen to not build Road 2010, which would have accessed these units, but to have these units helicopter yarded to Road 20. In the Gypsy Creek area, I have changed the harvest prescriptions in Units V-61 and V-64 from clearcut to individual/group selection with 70 percent retention. I have also changed the prescription of Unit V-71 from clearcut to patch cut with 60 percent retention. I believe this decision will retain structure and provide wildlife security in these travel corridor areas, while allowing harvest of additional timber volume in the project area. The physical closure of the road north of Gypsy Creek, and the decision not to build Road 2010 in Moose Creek, will mitigate possible negative impacts associated with roaded access to areas that are important travel corridors for deer and other wildlife.
- 10) The primary recreational uses of the Madan Project Area are fishing and hunting around Virginia Lake and Mill Creek. The availability of new roaded access in the Jenkins Cove and Moose Creek areas will increase opportunities for hunting and hiking within easy boating distance of the community of Wrangell. The portion of the area to be clearcut will provide increased forage and improved habitat for early-successional species during the period from harvest to canopy closure of the new stands. Allowing a portion of the new road system to remain open, coupled with the decision to close the Gypsy Creek Road, is a reasonable balance that will accommodate subsistence and recreational hunting, while at the same time providing longer term security for deer and other species within much of the project area.
- 11) The Selected Alternative allows construction of new LTFs at Jenkins Cove and Moose Creek. While the analysis in the Final EIS focused primarily on LTF designs for placing logs directly into the water, I have chosen to allow the timber sale contractor to present alternative designs that would accommodate either direct watering of logs or barging of logs. As presented in the Final EIS, construction of direct land-to-water LTFs at the selected sites will not have a significant effect to the marine environment. If an operator chooses to build an LTF on the same or smaller footprint that could accommodate barge loading and meets all permitting requirements, I will allow it.

## How Significant Issues are Addressed

In making my decision, I considered five major issues identified during the planning process. In the following summary, I disclose how the Selected Alternative addresses each of the significant issues. Table ROD-3, along with Chapter 2 (especially Table 2-1) and Chapter 3 of the Final EIS, supplement the following discussion and provide a comparison of the alternatives.

### Issue 1: Scenic Quality and Recreation Values

This issue addresses concerns for scenery and outdoor recreation opportunities, particularly in and around Virginia Lake and along the Eastern Passage.

The Selected Alternative defers harvest in units that could be viewed directly from Virginia Lake, thus it would have no effect to the scenery or recreation opportunities associated with the lake or the recreation cabin.

The approach to managing most of the area that is visible from Eastern Passage is to treat large blocks of land with helicopter harvest, retaining 70 percent of the existing structure. Based on analysis in the Final EIS and experience gained from similar harvest methods on other sales, I feel this approach allows a modest timber harvest while at the same time retaining a high level of scenic quality.

Currently, the area away from Virginia Lake provides primarily unroaded, remote access recreation opportunities. The Selected Alternative will develop opportunities for limited road access at both Jenkins Cove and Moose Creek. Based on the project location, it is likely that both road systems will get some use by hikers and hunters who boat to the sites from Wrangell. It is possible some people may bring All-terrain Vehicles (ATVs) to access the 9.5 miles of road (based on ground miles) that would remain open following timber harvest. This opportunity is compatible with the Forest Plan and offers people, who desire this type of recreation setting, access to a small portion of the mainland without having a negative impact to other resources in the larger area.

### Issue 2: Timber Management and Economics

The Selected Alternative uses a mix of even-aged and uneven-aged management to harvest timber from approximately 2,118 acres of National Forest System lands. Even-aged units account for 27 percent of the selected harvest acres. Within these units, we will retain at least 10 percent of the existing trees per acre over 9 inches DBH. Within the remaining 73 percent of the harvest acres, 60 to 70 percent of the stand structure will be retained.

The Selected Alternative would provide about 27 MMBF of timber (from stand exam based estimates), which would contribute to the Forest Service's attempt to seek to meet market demand while being consistent with the Tongass Forest Plan and the Standards and Guidelines for all resources. Timber from this sale is needed as a component of the timber sale schedule to provide material to industry in an even flow over the ten-year planning cycle.

Table ROD-3.

**Summary of the Selected Alternative Relative to the Issues**

Issue	Units	Sel. Alt.
<b>Scenic Quality and Recreation Values</b>		
Area of clearcuts seen from KVA 1—Virginia Lake	acres	18
Area of uneven-aged management seen from KVA 1—Virginia Lake	acres	0
Area of clearcuts seen from KVA 2—Eastern Passage	acres	97
Area of uneven-aged management seen from KVA 2—Eastern Passage	acres	411
Loss of Non-motorized ROS settings <sup>1</sup>	acres	3,252
<b>Timber Management and Economics</b>		
Total volume of timber harvested	MBF	26,581
Total area treated	acres	2,118
Area clearcut (with 10% retention) by cable	acres	535
Area clearcut (with 10% retention) by helicopter	acres	35
Area of patch and selection harvest by cable	acres	185
Area of patch and selection harvest by helicopter	acres	1,363
Percent of suitable land harvested	%	24
Net stumpage high-value market <sup>2</sup>	\$/MBF	150.87
Net stumpage low-value market <sup>3</sup>	\$/MBF	(248.82)
Expected Bid under Current Conditions (June 2002 NEAT) <sup>4</sup>	\$/CCF	(41.48)
Classified road construction <sup>5</sup>	miles	13.0
Temporary road construction <sup>5</sup>	miles	4.7
<b>Wildlife Habitat</b>		
Area of productive old growth with reduced volume due to selective harvest	acres	1,260
Area of productive old growth changed to early seral vegetation due to clearcut harvest	acres	565
Area of productive old growth in Virginia Lake OGR	acres	3,959
Area of productive old growth in Madan OGR	acres	2,118
Future road density in WAA 1810 <sup>5</sup>	mi/mi <sup>2</sup>	0.06
Future road density in WAA 1811 <sup>5</sup>	mi/mi <sup>2</sup>	0.08
Future project area open road density under Road Management Option A <sup>5</sup>	mi/mi <sup>2</sup>	0.40
Future project area open road density under Road Management Option B <sup>5</sup>	mi/mi <sup>2</sup>	0
Long-term change in deer habitat capability	%	(6.6)
Reduction in amount of high-value (HSI >0.6) deer winter range (1,395 ac in Project Area)	acres	294
Reduction in amount of high-value marten habitat (7,509 ac in Project Area)	acres	895
Reduction in amount of high-value goshawk habitat (5,402 ac in Project Area)	acres	542
Reduction in amount of high-value murrelet habitat (15,992 ac in Project Area)	acres	1,008



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Table ROD-3.

## Summary of the Selected Alternative Relative to the Issues (Continued)

	Units	Sel. Alt.
<b>Road Access Management</b>		
Roads open to motorized travel use in Option A <sup>5 6</sup>	miles	9.5
Roads open to motorized travel use in Option B <sup>5 6</sup>	miles	0
Percent of Project Area within one mile of road		29.8
<b>Madan Inventoried Roadless Area</b>		
Size of Roadless Area after Implementation	acres	64,078
<b>Other Issues</b>		
Area of harvest-related ground disturbance	acres	90
Area of road-related ground disturbance <sup>5</sup>	acres	120
Area of harvest on MMI 3 soils	acres	567
Road length on MMI 3 and MMI 4 soils <sup>5</sup>	miles	4
Jenkins Cove LTF constructed	Y/N	Y
Moose Creek LTF constructed	Y/N	Y
Timber volume processed through Jenkins Cove LTF	MBF	18,806
Timber volume processed through Moose Creek LTF	MBF	7,775
Timber volume processed through barge	MBF	0
Percent of evaluation watershed area harvested <sup>7</sup>	%	2.2
Percent of watershed area roaded <sup>5</sup>	%	0.3
Number of Class I stream crossings	#	0
Number of Class II stream crossings	#	6
Road length on wetlands <sup>5</sup>	miles	6.4
Roads constructed on wetlands <sup>5 8</sup> (7,925 acres of wetlands in Project Area)	acres	39
Percent area of Virginia Lake area harvested <sup>9</sup>	%	0.2

<sup>1</sup> Includes the net reduction in Primitive and Semi-primitive Non-motorized ROS settings, combined.

<sup>2</sup> This value, based on prices for June 1995 (second quarter) adjusted to 1998 dollars, was developed from the estimates originally developed for Alternatives 2 through 5.

<sup>3</sup> This value, based on prices for December 1998 (fourth quarter) adjusted to 1998 dollars, was developed from the estimates originally developed for Alternatives 2 through 5.

<sup>4</sup> This value was calculated using the NEPA Economic Analysis Tool (NEAT) and prices for June 2002 (second quarter). The value is expressed in 2002 dollars and assumes a 12-inch utilization standard.

<sup>5</sup> The road lengths in this table are GIS lengths, which are typically slightly less than lengths measured on the ground. Total length of GIS roads in the selected alternative are 17.7 miles vs. 18.8 miles when measured on the ground. Elsewhere in this ROD, ground miles are used.

<sup>6</sup> Includes the use of non-highway vehicles.

<sup>7</sup> Evaluation watersheds include Porterfield Creek, Glacier Creek, Virginia Lake, Gypsy Creek, Jenkins Creek, Madan Bay, and Moose Creek.

<sup>8</sup> Assumes a 50-ft-wide road width, although the majority of the roads would be 25-ft wide.

<sup>9</sup> Includes the Glacier Creek (A07C), Porterfield Creek watershed (A07B), and the small watersheds draining into Virginia Lake (A07D).

Values in parentheses ( ) are negative.

### Acronyms:

KVA=Key Viewing Area

MMBF=Million Board Feet

HSI=Habitat Suitability Index

LTF=log transfer facility

OGR=Old-Growth Reserve

ROS=Recreational Opportunity Spectrum

MBF=Thousand Board Feet

MMI=Mass Movement Index

WAA=Wildlife Analysis Area

Since the Selected Alternative modifies Alternative 2 with design features of Alternative 3, most of the resource outputs fall within the range of values shown in the Final EIS for those two alternatives. This decision makes some economic trade-offs to favor specific ecological values as listed below.

- The Selected Alternative provides for harvest on almost the same total acres as Alternative 2; however, the amount of clearcut harvest is 221 acres less than the amount of clearcutting represented in Alternative 2.
- While the total acres treated are similar to Alternative 2, the estimated volume to be removed is 5 million board feet less for the Selected Alternative.
- Compared to Alternative 2, the amount of cable harvest is reduced by approximately 128 acres, and the amount of helicopter harvest increased by approximately 141 acres. This change in yarding systems will lead to a higher overall cost of yarding than Alternative 2 presented.
- In comparison to Alternative 3, constructing Road 1020 into Unit J-31 significantly reduces the average helicopter yarding distance. This reduction in yarding distance will lead to a lower overall cost of yarding than Alternative 3 presented.

The Selected Alternative will stimulate regeneration and will provide for rapid growth within the regenerated stands. Volume is expected to recover to current levels within 30 years in stands that are partial cut, which provides options for future entries should they be desired.

The harvest economic analysis contained in the Final EIS resulted in a stumpage value range of -\$255.96/MBF at low market conditions, to \$135.53/MBF at high market conditions for Alternative 2, with Alternative 3 ranging about \$30/MBF less in both low and high markets. Stumpage values actually received on timber sales are highly variable and are highly subject to market conditions and demand at the time the sale is offered.

## **NEPA Economic Analysis Tool (NEAT)**

In the midst of planning and developing the Madan project, the Tongass began using the NEAT model to compare economic effects of each alternative. The NEAT program is a Forest Service Transactional Evidence Appraisal (TEA) system used to determine the economic viability of proposed timber sales. The TEA system calculates the expected bid for each alternative based on the weighted average values of the last 10 timber sales sold, adjusting those values to account for differences between the weighted averages of each of the alternatives. Using the TEA system is considered more realistic because it uses current values and market demand, not historical high market-low market scenarios.

The model provides three basic economic outputs:

- The expected bid of each alternative in \$/hundred cubic feet (CCF) based on current market conditions over the preceding 15 calendar quarters.
- Financial efficiency information, which is expected bid (\$/CCF) by species multiplied by the volume for each species minus the sale preparation costs (e.g., NEPA preparation, sale preparation, sale administration, and engineering support costs).
- Projected employment and income, which are estimated by multiplying unit values for jobs and income (e.g., jobs and income per CCF) by total project volume.

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There are a number of cost efficiency factors that can be adjusted within the NEAT program. These cost efficiency factors, which reflect upon sale profitability, can be imposed at the time of sale offering. These factors include road construction costs and specifications; timber designation and utilization standards; and timber export vs. domestic processing. Adjusting these efficiency factors has a great deal of influence upon the expected bid value. Of these efficiency factors, the only one that may impose any environmental effects of any consequence is the adjustment of timber designation and utilization standards. For example, by increasing the top diameter inside bark (DIB) and allowing utility to remain standing in the unit, there would be a slight increase in both standing structure and down-residue. Neither of these provisions would have any measurable effects upon reforestation, fuel hazard or soil nutrient and stability factors. Conversely, favorable effects could be achieved upon wildlife structure, visual quality and soil and watershed stability.

All of the Madan alternatives were analyzed within the NEAT program. The Selected Alternative was analyzed using all the traditional cost efficiency factors and analyzed again after adjusting the top end utilization standard to 12 inches DIB. At a 6-inch DIB the Selected Alternative generated a -\$55.80/CCF Expected Bid Value using data updated through June 2002. After adjusting the top DIB to 12 inches, the NEAT model generated a -\$41.48/CCF Expected Bid Value.

Based on these findings, I feel that appropriate sale cost adjustments can be implemented at the time of sale offering to result in a profitable timber sale project.

## Issue 3: Wildlife Habitat

This issue reflects the concern for potential reduction in wildlife habitat capabilities for key Management Indicator Species found in the Madan project area. The Wildlife section in Chapter 3 of the Final EIS discusses these concerns in detail. There are two small OGRs within the Madan Project Area that have been expanded based on reviews by biologists from state and federal agencies. Within the project area, there are three main blocks of old-growth forest: the area south and east of Virginia Lake, the area north and east of Madan Bay, and the Moose Creek drainage.

The area southeast of Virginia Lake is mostly medium and high volume old-growth, approximately two-thirds of which is included in the modified Virginia Lake OGR. By dropping Units V-78, V-97, V-111, and V-112, much of the old-growth block outside the OGR will also remain intact.

About two-thirds of the block north and east of Madan Bay is included in the modified Madan Bay OGR. Most of the old growth north of the Madan OGR will be managed with partial harvest, retaining 70 percent of the stand within harvest units. The retained structure and composition is within the range of variability for undisturbed landscapes, thus maintaining all high value wildlife habitat components found in old-growth stands.

The Moose Creek block will have harvest within it. However, the Selected Alternative mitigates some of the impacts to the area by changing the harvest prescriptions in Units M-140 and M-148 from clearcut to selection harvest with 70 percent retention, and by not constructing Road 2010 (3 miles).

Wildlife travel corridors were identified as part of the wildlife habitat issue. The 1,000-foot beach fringe provides some connectivity within the project area, but two areas of concern outside the beach fringe are the Moose Creek drainage and the area north of Gypsy Creek. As described above, changing prescriptions in two units and deferring 3 miles of road in the Moose



Creek area will retain much of the wildlife corridor values throughout the drainage and eliminate potential harassment which occurs with open roads. I have also chosen to implement high-retention prescriptions in Units V-61, V-64 and V-71, north of Gypsy Creek, in order to retain additional structure within those units that are part of the wildlife corridor between Virginia Lake and Mill Creek. In addition, closing the road north of Gypsy Creek to motorized traffic will benefit wildlife using that area, by reducing potential for harassment.

Based on analysis in the Final EIS, none of the alternatives considered would have significant effects on Management Indicator Species. The Selected Alternative incorporates partial harvest that retains 60 to 70 percent of the stand structure within units on 73 percent of the acres harvested.

When timber harvest is completed, 9.5 miles of road (based on ground miles) will remain open. The open road density in the project area following implementation of the Selected Alternative will be less than  $0.4 \text{ mi/mi}^2$  within watersheds that have road construction or timber harvest. When viewed in the larger context of the Wildlife Analysis Areas (WAAs), open road density will be less than  $0.08 \text{ mi/mi}^2$ , or less.

Based on my review of the Final EIS, the impact of any of the alternatives developed would be acceptable in relation to biodiversity and wildlife species impacts. I believe the modifications made in developing the Selected Alternative best balance the need for wildlife structure and function with the need to harvest timber.

### Issue 4: Road Access Management

This issue addresses concerns for road access management within the Madan Project Area. While some people would like to see no roads constructed in the project area, others would like to see roads built for recreation and subsistence activities, as well as for timber harvest. To achieve a balance in addressing these values, I chose to refrain from building roads and/or to close them after harvest in areas most critical to wildlife and provide access in less sensitive areas.

The Selected Alternative will build 13.5 miles of classified (specified) road and 5.3 miles of temporary road within the project area (based on ground miles). To balance the desires for wildlife security and habitat protection with the opportunity for additional motorized and non-motorized recreation within reasonable boating distance of the local community, about half of the new roads will be closed and half will remain open. When logging is complete, a total of 9.5 miles of road will remain open as follows:

- Road 10 from Jenkins Cove to Gypsy Creek (2.7 miles),
- Road 1010, which heads south from Road 10 toward Madan Bay and accesses Units J-5, J-10 and J-13 (2.1 miles),
- Road 1020 to milepost 1.75, which accesses Units J-30 and J-31 (1.8 miles), and
- Road 20, which is the mainline road in the Moose Creek drainage (2.9 miles).

A subsistence hearing was held in Wrangell, Alaska, for a similar project; those in attendance wanted to see all new roads accessible for at least ATV use after the timber sale was completed. Wildlife biologists working on the Madan project expressed concerns about post-sale impacts of new roads because they could impact important summer and fall deer habitat and wildlife travel corridors. In response to this concern, the Selected Alternative will close Road 10 beyond Gypsy Creek to all motorized vehicles by removing selected drainage structures and by a Forest Order prohibiting motorized use of the road. Also, by choosing not to construct Road 2010 in

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Moose Creek, I have allowed for some access into the Moose Creek drainage while protecting overall wildlife values. All temporary roads in the project area will have drainage structures removed and natural drainage patterns restored.

## Issue 5: Madan Inventoried Roadless Area

The Roadless Area Conservation, Final Rule (Roadless Rule) was signed by the Secretary of Agriculture in January 2001. This rule generally established prohibitions on road construction, road reconstruction, and timber harvest in roadless areas on National Forest System lands. The inventoried roadless areas, which these prohibitions apply, are identified in a set of maps contained in the Forest Service Roadless Area Conservation, Final EIS, Volume 2, dated November 2000. (For the Tongass, these maps correspond closely with the 1996 roadless inventory that was done for the 1997 Forest Plan Revision.) The rule prohibits logging and road building on nearly 60 million acres of lands, 9.3 million acres of which are within the Tongass National Forest. A mitigation measure included in the roadless rule exempted those Tongass projects which had a notice of availability for a Draft EIS published prior to the rule. The Madan project (which had a notice of availability published on June 23, 2000) is one of five on the Tongass exempt from the 2001 Roadless Rule.

Approximately 61 percent of the 69,738-acre Madan Inventoried Roadless Area (#204) are within the Madan Project Area (note that this acreage differs from the Forest Plan SEIS (2003) acreage of 69,126 because of inclusion of Virginia Lake). During the analysis for the revision of the Forest Plan, the inventoried roadless areas were reevaluated for their value as undeveloped area or for potential inclusion in the National Wilderness Preservation System (Forest Plan FEIS, Appendix C). The portion of the Madan Inventoried Roadless Area within the Madan Project Area has been allocated to both developmental and non-developmental land use designations (LUDs)(see Table 3-33 in Madan FEIS). Timber harvest and road developments are allowed in development LUDs including Timber Production (3,615 acres), Modified Landscape (16,700 acres), and Scenic Viewshed (16,077 acres). The Selected Alternative harvests timber from 2,118 acres. Of these acres, 570 acres will be clearcut with 10 percent retention and the remaining 1,548 harvested acres would receive partial harvest with either 60 or 70 percent retention. When roadless buffers are applied to the Selected Alternative, approximately 5,660 acres of the project area will be considered developed. Roadless buffers as applied in this context are 600 feet from every unit, except isolated helicopter units, and 1,200 feet from every road (Table ROD-4).

With implementation of the Madan Project, over 90 percent of the Madan Roadless Area will remain roadless, including the area that contains the highest values for resources other than timber. Following implementation, it would still qualify as an inventoried roadless area and would still be eligible for inclusion in the National Wilderness Preservation System because it would have approximately 64,100 acres absent of roads and timber management.



Table ROD-4.

**Approximate Madan Inventoried Roadless Area Acres**

<b>Madan Inventoried Roadless Area (#204)</b>	<b>69,700 acres</b>
Roadless Area within Madan project area	42,800 acres
Timber harvest: clearcut with 10% retention	570 acres
Partial harvest with 60% to 70% retention	1,548 acres
Total timber harvest (clearcut + partial harvest)	2,118 acres
Total developed area including roads, units and roadless buffers	5,660 acres
<b>Madan Roadless Area (#204) after project implementation</b>	<b>64,100 acres</b>

## Public Involvement

Public involvement has been instrumental in identifying issues, formulating alternatives and influencing this decision. Public meetings, *Federal Register* notices, newspaper and radio releases, open houses, the Schedule of Proposed Actions, and group and individual meetings were some of the tools used to solicit input for this project.

**Preliminary Scoping Letter:** In April of 1998, a preliminary scoping letter was sent to everyone on the Stikine Area Project Schedule to identify possible issues for a possible timber sale on the mainland near Madan Bay.

**Notice of Intent:** A Notice of Intent to Prepare an Environmental Impact Statement was published in the *Federal Register* on October 22, 1998, when it was decided that an EIS was to be completed for the project.

**Availability of the Draft EIS for Public Comment:** Availability of the Draft EIS was announced in the *Federal Register* on June 23, 2000 and through notices in local papers. The deadline for public comments was August 15, 2000. Documents were also mailed to Federal and State agencies, Native and municipal offices, and others who requested them. The letters received during the comment period on the Draft EIS were responded to in the Final EIS (Appendix H).

**Open Houses:** Two open house public meetings were held in Wrangell during the scoping period to solicit comments.

**Analysis and Incorporation of Public Comments:** Public comments have been analyzed and incorporated into the Final EIS. Thirteen agencies, organizations, and individuals submitted written comments on the Madan Draft EIS. Public comments, along with the Forest Service's responses, are listed in Appendix H of the Final EIS.

**Subsistence Hearing, March 2003:** In accordance with Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), a subsistence hearing was held in Wrangell, Alaska, March 14, 2003, at the Wrangell Ranger District conference room. The date, time, and location of the subsistence hearing were publicized in the local media. No testimony was received.

Availability of the Final EIS was announced in the *Federal Register*, *Juneau Empire* (newspaper of record) and through notices in the local media. Documents were also mailed to

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Federal and State agencies, Native and municipal offices, and others that provided comments on this project or requested them.

## Coordination with Other Agencies

From the time scoping was initiated, meetings and site visits with all interested State and Federal agencies have occurred. Issues were discussed and information was exchanged. Alaska Department of Fish & Game, Alaska Department of Environmental Conservation, and U.S. Fish and Wildlife Service personnel visited the Project Area during the Draft EIS development.

Coordination meetings were held with the State of Alaska including the Department of Fish and Game and the Department of Environmental Conservation. The Alaska Coastal Management Plan (ACMP) consistency review process was initiated upon publication of the Draft EIS through the offices of the Alaska Division of Governmental Coordination (recently relocated under the Department of Natural Resources as the Office of Project Management Permitting). The State of Alaska has conducted a consistency review of the project and concurs with the Forest Service finding that the project is consistent with the Coastal Zone Management Act.

A Biological Assessment was prepared and sent to the U.S. Fish and Wildlife Service and to the National Marine Fisheries Service as part of the Section 7 consultation under the Endangered Species Act. They have concurred that the actions described within the proposed project are not likely to adversely affect threatened and endangered species.

The Final EIS identifies the agencies that were informed of and/or involved in the planning process (see the Distribution List in Chapter 6 of the Final EIS).

## Alternatives Considered in Detail

Five alternatives were considered in detail in the Final EIS. Each action alternative is consistent with the Tongass Land and Resource Management Plan. The analysis of each action alternative displays (1) the areas considered for harvest, (2) the location of any proposed roads for access, and (3) the type of logging systems to be used. For a complete description of these alternatives, refer to Chapter 2 of the Final EIS. The alternatives as developed in the Final EIS are as follows.

Alternative 1 – This alternative would not propose any new timber harvest from the Madan Project Area at this time. It does not preclude timber harvest from other areas at this time, or from the Madan Project Area at anytime in the future. This alternative serves as a benchmark by which effects of the action alternatives can be measured. This alternative would respond to the issues of scenic quality, recreation value, the maintenance of roadless character and wildlife habitat protection, including old-growth forests, by not building roads or harvesting timber at this time. This alternative, however, would not respond to the issue of providing employment and contributing to the local economy and would not contribute sawtimber or other wood products to meet the annual demand for Tongass National Forest timber from the Project Area, as described in the Purpose and Need (Chapter 1). Under this alternative, the small OGRs, located at Virginia Lake and Madan Bay, would remain as mapped in the Forest Plan.

This alternative would not move the Project Area towards the desired future condition described in the Forest Plan (Tongass Forest Plan Revision, 1997). The existing condition would continue to be influenced by natural disturbance processes. The CEQ regulations (40 CFR 1502.14d) require that a “No Action” alternative be analyzed in every EIS. This alternative represents the



existing condition against which all other alternatives are compared. The Alternative 1 (Existing Condition) map (FEIS, Figure 2-1) shows the distribution of vegetation associated with no new timber harvest.

Alternative 2 – This alternative emphasizes economic timber harvest within the constraints of Forest Plan standards and guidelines. Timber volume is maximized to the extent that harvest can be achieved economically. It includes the harvest of approximately 32 MMBF from approximately 2,105 acres. It involves the development of approximately 21 miles of road, including 3 miles of temporary road (based on GIS road miles). This alternative focuses on establishing the infrastructure in this initial entry for use in subsequent entries. It constructs LTFs at Moose Creek and Jenkins Cove. It features timber development within Virginia Lake, Gypsy Creek, Jenkins Cove, and Moose Creek watersheds. It employs a variety of harvest methods including helicopter, live and running skyline, and highlead systems. It relies more on conventional silvicultural prescriptions (such as clearcuts with minimum 10 percent volume retention) than other alternatives.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, as shown in Figure 2-2 of the FEIS. These modifications are based on recommendations from the IDT and resource agencies.

Alternative 3 – Alternative 3 limits road construction and acres of treatment within the Moose Creek watershed and defers road construction and timber harvest entirely within the Virginia Lake watershed. It also limits road construction within the Jenkins Cove and Gypsy Creek watersheds. It includes the harvest of approximately 19 MMBF from approximately 1,719 acres. It requires the development of approximately 9 miles of road, including 1 mile of temporary road (based on GIS road miles). It utilizes conventional harvest prescriptions and methods adjacent to the constructed road segments, but proposes high-retention selection harvest prescriptions for the majority of the suitable timber within the Jenkins Cove watershed. These prescriptions include individual/group selection harvest by helicopter with approximately 25 percent stem removal within most of the suitable stratum. Two LTFs, one at Jenkins Cove and one at Moose Creek, would be constructed.

Because of the large amount of selection harvest and the low density of roads, this alternative is the second-most responsive to the scenic issue. It also addresses the road access management and wildlife habitat conservation issues by limiting road building and leaving structure and vegetative cover in place for species, which benefit from mature forests. Future road development options and harvest opportunities within the Moose Creek and the Virginia Lake watersheds are retained.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, as shown in Figure 2-3 of the Final EIS. These modifications are based on recommendations from the IDT and resource agencies.

Alternative 4 – Alternative 4 emphasizes helicopter harvest and minimizes road construction. This alternative defers all treatment and does not construct roads within the Virginia Lake watershed (as in Alternative 3) and throughout most of the Gypsy Creek watershed. All harvest within the Jenkins Cove watershed would be by individual tree or group selection. This alternative would include the construction of 0.3-mile of road and a sort yard in the Jenkins Cove area, and all harvest would be by helicopter with approximately 25 percent stem removal within most of the suitable stratum. Stem removal would be increased to 50 percent in Units J-5, J-10, and J-13 because these units are largely not seen. This alternative also includes utilizing two barges to provide for more economical helicopter yarding distances. One barge would be

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located south of Jenkins Cove and another would be located at the head of Madan Bay. In these areas, logs would be yarded directly to the barges and limbed. Then they would either be loaded onto an adjacent barge for transport, or returned to the LTF for sorting and bundling.

In the Moose Creek drainage, the LTF and transportation system would be fully developed and harvest would be almost at the same level and using the same prescriptions as in Alternative 2. This level of harvest is consistent with the Forest Plan designation of Timber Production in most of this watershed and may be necessary to make this alternative economically viable.

Overall, this alternative includes the harvest of approximately 19 MMBF from approximately 1,769 acres. It involves the development of approximately 7 miles of road, including 1 mile of temporary road (based on GIS road miles).

Because of the high proportion of selection harvest and the lack of roads, this alternative is the most responsive to the scenic issue. It also addresses the road development/access management and wildlife habitat/species conservation issues. Future road development options and harvest opportunities within the Virginia Lake watershed are retained.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, as shown in Figure 2-4 of the FEIS. These modifications are based on recommendations from the IDT and resource agencies.

Alternative 5 – Alternative 5 defers all treatment within the Moose Creek watershed. It maintains the existing condition of all resources as well as future options for timber harvest and road construction in this watershed. This alternative treats the Virginia Lake, Gypsy Creek, and Jenkins Cove watersheds at the same level as in Alternative 2. This includes maximum road development and conventional harvest where practical. It includes the harvest of approximately 21 MMBF from approximately 1,352 acres. It involves the development of approximately 15 miles of road, including 2 miles of temporary road (based on GIS road miles). Only the Jenkins Cove LTF would be developed.

This alternative is responsive to the road access management and wildlife habitat conservation issues in the Moose Creek watershed. In other areas, it emphasizes economic timber harvest within the constraints of Forest Plan standards and guidelines.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, as shown in Figure 2-5. These modifications are based on recommendations from the IDT and resource agencies.

## Environmentally Preferred Alternative

No single factor can be used to determine which alternative is environmentally preferable. Maintaining the basic productivity of the land and the quality of lifestyle of the local residents are vitally important.

Based on a comparison of the alternatives and the discussion contained within Chapter 3 of the Final EIS, Alternative 1, the No-Action Alternative, would cause the least environmental disturbance and from that standpoint may be considered the environmentally preferred alternative of all the alternatives studied in detail. All the alternatives considered in detail have varying levels of environmental effects depending on the emphasis of the alternative. Implementation of Alternative 4 would cause the least adverse environmental effects of all the



action alternatives as it has the least amount of road construction and the fewest acres of clearcut harvest prescriptions.

## Alternatives Not Considered in Detail

**Full Entry/Limited Road Emphasis** – This alternative was a precursor of Alternative 3, but would have allowed entry into all areas entered under Alternative 2. It would have limited road construction by allowing only mainline roads and short spurs to be built and avoiding construction of higher elevation roads. Higher elevation units would have been harvested by helicopter and most helicopter units under Alternative 2 would have been included. Units near Glacier Creek and the eastern half of Virginia Lake were not included in this alternative. Compared with Alternative 3, it permitted entry into more areas, but did not include as much helicopter harvest in the Jenkins Cove area. This alternative was dropped from detailed study because the issues it addresses and its effects fall within the range of the alternatives considered in detail. In general, its effects would be greater than those of Alternative 3 and less than those of Alternative 2.

**Visual/Wildlife Emphasis with Roads** – This alternative was a precursor of Alternative 4 and would have avoided harvest in areas with highest visual and wildlife values. It would have avoided harvest in high volume stands, especially those with high deer winter range or goshawk habitat values. It would have also avoided harvest in areas with the highest visual concerns, especially along Virginia Lake and along saltwater shorelines from Madan Bay south. Compared with Alternative 4, it permitted entry into more areas and greater road development, but did not include as much helicopter harvest in the Jenkins Cove area. This alternative was dropped from detailed study because the issues it addresses and its effects fall within the range of the alternatives considered in detail.

**Helicopter-only Alternative** – A helicopter-only alternative would respond to the roadless issues as well as potential effects upon marine resources associated with LTFs. By implementing an all-helicopter alternative the potential effects of road construction would be avoided. Soil displacement associated with road construction would not occur. There would be no stream crossings. Cable corridors would not be imposed on the visual landscape zone; however, by implementing a helicopter-only alternative, no infrastructure would be developed for potential future entries in the Madan development LUDs and management would only occur within the lower slopes of the project, beyond the 1,000-foot beach buffer. As shown below, the expense of helicopter yarding makes a helicopter-only alternative much less viable than the alternatives considered in detail. Alternative 4 does fully consider helicopter-only yarding in the Jenkins Cove portion of the project area, and Alternative 5 fully considers no harvest in the Moose Creek drainage, thus alternatives considered in detail do include the components of a helicopter-only sale in the project area.

Harvest units up to 1 mile from saltwater were considered in this alternative. These units included J-1, J-4, J-5, J-10, J-13, J-30, J-31, J-42, J-49, J-50, J-52, J-53, J-201, J-203, and J-204. Combined these units would include approximately 800 acres of 70 percent retention harvest prescriptions and 225 acres of clearcut with 10 percent retention prescriptions, yielding about 9 million board feet. No roads or LTFs would be developed with this alternative. Due to extremely long flight distances, no units within the Moose Creek drainage were considered for inclusion in a helicopter-only alternative. To determine the economical viability of this alternative, it was analyzed through the NEPA Economical Analysis Tool (for more discussion on NEAT, see Issue 2 in the ROD and FEIS). Applying the same sensitivity factor as the other alternatives, the top end log diameter was adjusted from 6 inches to 12 inches. The NEAT

# Record of Decision

analysis resulted in an expected bid value of -\$81.24/CCF. The other alternatives expected bid value with the same sensitivity adjustment ranged from -\$31.87 to -\$54.79. Because the helicopter-only alternative resulted in an expected bid value of -\$81.24, and because the components of a helicopter-only alternative are included in Alternatives 4 and 5, it was not considered in detail in the FEIS as a separate alternative.

**LTF-Barge Only Alternative** – Several people asked us to consider a barge-only log transfer facility (LTF) for this project to avoid the impacts of bark deposition in the marine environment that occurs when logs are placed directly into the water. An LTF that is designed with a ramp or slide for direct watering of logs can fairly easily be altered to accommodate barge loading without significant change to the “footprint” or the area impacted. The converse is not true, in that an LTF that is designed to accommodate barge loading would not easily be used for watering of logs. A barge-only facility could be designed with the same or slightly smaller in-water footprint than an LTF that allows watering of logs; however, to make a barge facility workable, a larger upland storage/sort yard would need to be developed close to the LTF where logs could be stockpiled between barge trips. Barging logs does result in less bark and woody debris accumulation in the marine environment; however, dive surveys at both Jenkins Cove and Moose Creek indicate there is adequate depth and current at these sites to accommodate watering of logs without significant adverse effects to the marine environment. According to the U.S. Fish and Wildlife Service, who conducted the dive surveys, neither of the potential LTF sites is situated in an area of high-value marine habitat. Designing the LTFs to accommodate either watering or barging of logs allows the most flexibility for use of the facility within current environmental standards.

For the reasons above, we have chosen not to develop, in detail, an alternative that provides for barge-only transfer of logs. For more information on the LTFs, see Appendix D of the FEIS.

## Planning Record

The planning record for this project includes the Draft EIS, Final EIS, Forest Plan, material incorporated by reference, and all materials produced during the environmental analysis of this project. The planning record is available for review at the Wrangell Ranger District office in Wrangell, Alaska.

## Mitigation

Mitigation measures are steps taken to avoid, reduce, minimize or eliminate the adverse effects of actions. Numerous mitigation measures were applied in the development of the project alternatives, including the Selected Alternative, and in the design of the harvest units and roads.

Mitigation measures applicable to the Selected Alternative include measures contained in the Standards and Guidelines of the Forest Plan, and applicable Forest Service Manuals and Handbooks. The Final EIS includes mitigation measures described in Chapter 2 and in Appendix E, Mitigation Measures. Site-specific mitigation measures are included in Unit Cards and Road Cards for the Selected Alternative, which are attached to this Record of Decision (Appendices 2 and 3). These measures to avoid or minimize adverse environmental effects of the project have been incorporated into the Selected Alternative, and are adopted as part of this decision and will be implemented.



## Monitoring

A monitoring program is the process by which the Forest Service can evaluate whether the resource management objectives of the final environmental documents have been implemented as specified and whether the steps identified for mitigating the environmental effects were effective. Monitoring requirements are specified in Appendix G of the Final EIS. The following monitoring items are adopted as part of this decision and will be implemented.

- BMP, LTF, and Cultural Site monitoring will occur as part of ongoing sale administration.
- Management Indicator Species monitoring could occur if the site is selected for Forest Plan level monitoring.
- Deer Winter Habitat and Scenic Resources monitoring will occur if funding and personnel are available.

Each monitoring item describes the objective of the monitoring, what will be done, how it will be done, and the approximate cost of the monitoring. Monitoring activities may reveal results that deviate from planned effects, in which case, corrective actions are prescribed. The Wrangell District Ranger is responsible for ensuring that project implementation, mitigation, monitoring, and enforcement are accomplished as specified in the Final EIS.

## Findings Required By Law

### National Forest Management Act

The National Forest Management Act (NFMA) requires specific determinations in this Record of Decision: consistency with the Forest Plan; a determination of clearcutting as the optimal method of harvesting; and specific authorizations of created openings over 100 acres.

- **Tongass Land and Resource Management Plan and Region 10 Supplement 2400-2002-1** – This decision is consistent with the Tongass Forest Plan and the R10 Supplement for timber resource management planning. I have reviewed the management direction, standards and guidelines and the schedule of activities for the VCUs included in the Selected Alternative, and find the Selected Alternative to be consistent with these elements. The activities authorized in this decision are consistent with the standards and guidelines and management prescriptions of the Forest Plan.
- **Clearcutting as the Optimal Method of Harvesting** – The Forest Plan (pg. 4-96 to 4-97) gives guidance when to use even-aged management. Clearcutting (an even-aged method) is used in Alaska's western hemlock-Sitka spruce forests when one of the following situations occurs:
  - excellent regeneration of desired species is needed;
  - effective dwarf mistletoe control is needed;
  - there is a high risk of windthrow;
  - viable harvest economics; and/or
  - compatibility with the use of standard logging systems requires this system.

# Record of Decision

- Some units in the Selected Alternative have a high risk of windthrow. Clearcutting meets the objective of maintaining fast-growing, mistletoe-free stands of mixed species and is the optimum method of harvesting. Also, utilizing clearcutting will reduce the risk of blowdown in residual stands. The chance of blowdown along cutting boundaries in clearcuts will be mitigated through proper design of cutting boundaries. Specific information and rationale for use of this prescription is displayed in the Silvicultural Prescription and shown on units cards attached with this Record of Decision, in the project planning record, in the Final EIS in Chapter 3, and the rationale is summarized in this Record of Decision. Where used, this prescription has been deemed optimal related to site-specific considerations as described above.
- **Harvest Openings Over 100 Acres in Size** – There are no harvest openings over 100 acres proposed for this project.

## **Forest Service Transportation Final Administrative Policy (Roads Rule)**

The Tongass National Forest has prepared the Madan Project Area Final EIS to be consistent with the Forest Service Transportation Final Administrative Policy (Roads Rule). A Project scale analysis has been done for the Madan Project Area and this determination can be found in the planning record. The Forest scale roads analysis for the Tongass was completed in January 2003 and has been incorporated into the Forest Plan.

## **Tongass Timber Reform Act (TTRA)**

Harvest units were designed and located to maintain a minimum 100-foot buffer zone for all Class I streams and Class II streams that flow directly into Class I streams as required in Section 103 of the TTRA. The actual widths of these buffers follow Forest Plan Riparian Standards and Guidelines and greatly exceed TTRA requirements. The design and implementation direction for the Selected Alternative incorporate Best Management Practices (BMPs) for the protection of all streams.

## **Endangered Species Act**

Actions authorized in the Selected Alternative are not anticipated to have a direct, indirect, or cumulative effect on any threatened or endangered species in the Madan Project Area. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have concurred that the actions described within the proposed project are not likely to adversely effect threatened and endangered species. A complete biological assessment is included in the planning record for this project. I have determined that this action will not have any adverse impacts on any threatened or endangered species.

## **Bald Eagle Protection Act**

A Memorandum of Understanding (MOU) between the Forest Service and the U.S. Fish and Wildlife Service to facilitate compliance with the Bald Eagle Protection Act restricts management activities within 330 feet of an eagle nest site. The Selected Alternative has one eagle nest within ¼ mile of Road 20. Ground disturbance and repeated helicopter flights within ¼ mile of the nest will be avoided from March 1 through May 31. Surveys will be conducted prior to harvest to verify nest activity. If the nest is active, ground disturbance and repeated helicopter flights will continue to be avoided through August 31.

## **Clean Water Act**

Congress intended the Clean Water Act of 1972 (Public Law 92-500) as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4) to protect and improve the quality of water



resources and maintain their beneficial uses. Section 313 of the Clean Water Act and Executive Order 12088 of January 23, 1987 address Federal Agency compliance and consistency with water pollution control mandates. Agencies must be consistent with requirements that apply to “any governmental entity” or private person. Compliance is to be in line with “all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution.”

The Clean Water Act (Sections 208 and 319) recognized the need for control strategies for nonpoint source pollution. The National Nonpoint Source Policy (December 12, 1984), the Forest Service Nonpoint Strategy (January 29, 1985), and the USDA Nonpoint Source Water Quality Policy (December 5, 1986) provide a protection and improvement emphasis for soil and water resources and water-related beneficial uses. Soil and water conservation practices (BMPs) were recognized as the primary control mechanisms for nonpoint source pollution on National Forest System lands. The Environmental Protection Agency supports this perspective in their guidance, “Nonpoint Source Controls and Water Quality Standards” (August 19, 1987).

The Forest Service must apply BMPs that are consistent with the Alaska Forest Resources and Practices Regulations to achieve Alaska Water Quality Standards. The site-specific application of BMPs, with a monitoring and feedback mechanism, is the approved strategy for controlling nonpoint source pollution as defined by Alaska’s Nonpoint Source Pollution Control Strategy (October 2000). In 1997, the State approved the BMPs in the Forest Service’s Soil and Water Conservation Handbook (FSH 2509.22, October 1996) as consistent with the Alaska Forest Resources and Practices Regulations. This Handbook is incorporated into the Tongass Land and Resource Management Plan.

A discharge of dredge or fill material from normal silviculture activities such as harvesting for the production of forest products is exempt from Section 404 permitting requirements in waters of the United States, including wetlands (404(f)(1)(A)). Forest roads qualify for this exemption only if they are constructed and maintained in accordance with BMPs to assure that flow and circulation patterns and chemical and biological characteristics of the waters are not impaired (404)(f)(1)(E)). The BMPs that must be incorporated are located in the Forest Service’s Soil and Water Conservation Handbook under BMP 12.5

## **Essential Fish Habitat**

The potential effects of the project on Essential Fish Habitat are discussed in Chapter 3 of the Final EIS. This discussion includes reference to the Magnuson-Stevens Fisheries Conservation and Management Act that requires the Forest Service to consult with the National Marine Fisheries Service on projects that may affect Essential Fish Habitat. It also includes a description of the Essential Fish Habitat in the project area, a description of the proposed activities, and a description of the proposed mitigation measures that will be implemented to protect these habitats.

The Draft EIS was provided to the National Marine Fisheries Service to formally initiate the consultation process according to the agreement between the Forest Service and the National Marine Fisheries Service (dated August 25, 2000) on the method to complete Essential Fish Habitat consultation using National Environmental Policy Act procedures.

The National Marine Fisheries Service reviewed the Draft EIS and EFH agreement. They concurred that the project may adversely affect EFH, and that the appropriate measures to minimize those effects are the Forest Plan Standards and Guidelines. Formal Essential Fish

# Record of Decision

Habitat consultation is complete in accordance with the agreement between the National Marine Fisheries Service and the Forest Service.

## **National Historic Preservation Act**

Heritage resource surveys of various intensities have been conducted in the Madan Project Area. The State Historic Preservation Officer has been consulted, and the project complies with the provisions of 36 CFR part 800. Forest Service timber sale contracts contain enforceable measures for protecting any undiscovered cultural resources that might be encountered during sale operations. I have determined, consistent with Forest Service direction on cultural resources, that there will be no significant effects on cultural resources. We have completed the Section 106 review for all timber harvest related activities displayed in the Final EIS. This includes roads and units in all alternatives.

## **Federal Cave Resource Protection Act of 1988**

The actions in the Selected Alternative will not have a direct, indirect, or cumulative effect on any significant cave. There are few occurrences of carbonate rock and associated cave resources within the Madan Project Area. Field reconnaissance identified areas of concern and I have applied Forest Plan standards and guidelines for protection of these areas.

## **ANILCA Section 810, Subsistence Evaluation and Findings**

A subsistence evaluation was conducted for the five alternatives considered in detail, in accordance with ANILCA Section 810. The full analysis is located in the planning file for this project and summarized in Chapter 3 of the Final EIS. The evaluations in the Subsistence Report on abundance, distribution, access and competition for harvested resources in the Madan Project Area indicate that there is not a significant possibility of a significant restriction on subsistence uses of wildlife, fish and shellfish, marine mammals, other foods, and timber resources as a result of this sale.

On March 14, 2003, a Subsistence Hearing was conducted at the Wrangell District office. No public testimony was received.

## **Coastal Zone Management Act**

The Coastal Zone Management Act of 1972 (CZMA), while specifically excluding Federal lands from the coastal zone, requires that a Federal agency's activities be consistent with the enforceable standards of a State's coastal management program to the maximum extent practicable when the agency's activities affect the coastal zone.

I have determined that the Madan Timber Sale project may affect the coastal zone and those Forest Plan Standards and Guidelines and mitigation measures applicable to the Madan Timber Sale project meet or exceed the requirements of the State of Alaska Coastal Zone Management Plan. Therefore, the project is consistent to the maximum extent practicable with the enforceable policies of the Alaska Coastal Zone Management Program. The Alaska Office of Project Management and Permitting has concurred with this determination.

## **Consumers, Civil Rights, Minorities and Women**

No negative impacts to the civil rights of individuals or groups, including minorities and women are anticipated to be associated with this project. Additional information can be found in the Forest Plan Revision Final EIS Chapter 3 and Appendix H, as well as Chapter 3 of the Madan Final EIS.



## Executive Orders

EO 11988 (Floodplains) – Executive Order 11988 directs Federal agencies to take action to avoid, to the extent practicable, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. The Selected Alternative does not modify any floodplains. No roads will be constructed across floodplains, and no floodplains will be harvested.

EO 11990 (Wetlands) – Executive Order 11990 requires Federal agencies to avoid, to the extent practicable, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. The Selected Alternative avoids most identified wetlands; however, many small wetlands or muskegs occur as inclusions within forested areas. These areas may be altered by timber harvest or road construction. Techniques and practices required by the Forest Service serve to maintain the wetland attributes including values and functions. It is estimated there will be only minimal loss of wetlands with any of the alternatives. Soil moisture regimes and vegetation on some wetlands may be altered in some harvest units; however, these altered acres would still be classified as wetlands and function as wetlands in the ecosystem.

Because wetlands are found throughout the project area, it is not feasible to avoid all wetland areas. However, there are no development activities planned on the more biologically significant wetlands.

EO 12898 (Environmental Justice) – Executive Order 12898 directs Federal agencies to identify and address the issue of environmental justice, i.e. adverse human health and environmental effects of agency programs that disproportionately impact minority and low-income populations. The order specifically directs agencies to consider patterns of subsistence hunting and fishing when an agency action may affect fish or wildlife. I have determined that implementation of the Selected Alternative will not cause adverse health or environmental effects that disproportionately impact minority and low-income populations, as determined in Chapter 3 of the FEIS, and within the social, economic, subsistence and Heritage Resource sections.

EO 12962 (Recreational Fisheries) – Executive Order 12962 directs Federal agencies to conserve, restore and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. Section 1 of the Executive Order is most pertinent to the proposed activity. Section 1 directs Federal agencies to evaluate effects on aquatic ecosystems and recreational fisheries, develop and encourage partnerships, promote restoration, provide access, and promote awareness of opportunities for recreational fishery resources.

The effects of this project have been evaluated throughout the Final EIS, including effects to freshwater and marine resources. Partnerships are continuing to be used to leverage Federal project funds to address water quality concerns in areas of the Tongass National Forest, although none have been proposed for recreational fisheries in conjunction with this project.

The Selected Alternative attempts to minimize the effects on aquatic systems through project design, application of Forest Plan Standards and Guidelines, BMPs and site-specific mitigation measures. Recreational fishing opportunities will remain essentially the same because aquatic habitats are protected through implementation of BMPs and riparian buffers, and because the isolated road system is unlikely to result in significant increased use opportunities. Therefore, I have determined that there will be no significant effect to recreational fisheries.

# Record of Decision

## Federal and State Permits

Federal and State permits necessary to implement the authorized activities are listed in Chapter 1 of the Final EIS.

## Implementation Process

Implementation of this decision may occur no sooner than 50 days following publication of the legal notice of the decision in the *Juneau Empire*, published in Juneau, Alaska. This timber sale is planned to be offered in the fall of 2005.

This project will be implemented in accordance with Forest Service Manual and Handbook direction for Timber Sale Project Implementation in FSM 2431.3 and FSH 2409.24. This direction provides a bridge between project planning and implementation and will ensure execution of the actions, environmental standards, and mitigation approved by this decision, and compliance with TTRA and other laws. All applicable Best Management Practices (BMPs) will be applied to the Selected Alternative.

Implementation of all activities authorized by this Record of Decision will be monitored to ensure that they are carried out as planned and described in the Final EIS.

Appendix 2 of this Record of Decision contains the Selected Alternative harvest unit design cards. These cards are an integral part of this decision because they document the specific resource concerns, management objectives, and mitigation measures to govern the layout of the harvest units. These cards will be used during the implementation process to assure that all aspects of the project are implemented within applicable standards and guidelines and that resource impacts will not be greater than described in the Final EIS. Similar cards will be used to document any changes to the planned layout as the actual layout and harvest of the units occurs with project implementation.

The implementation record for this project will display:

1. Each harvest unit as actually implemented,
2. Any proposed changes to the design, location, standards and guidelines, or other mitigation measures for the project, and
3. Authorization of the proposed changes.

## Procedure for Changes during Implementation

Proposed changes to the authorized project actions will be subject to the requirements of the National Environmental Policy Act (NEPA), the National Forest Management Act of 1976 (NFMA), Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), the Tongass Timber Reform Act (TTRA), the Coastal Zone Management Act (CZMA), and other laws concerning such changes.

In determining whether and what kind of further NEPA action is required, the Forest Supervisor will consider the criteria in 40 CFR 1502.9(c), and FSH 1909.15, sec. 18, for whether to supplement an existing (EIS). In particular, whether the proposed change is a substantial change to the intent of the Selected Alternative as planned and already approved, and whether the change is relevant to environmental concerns. Connected or interrelated proposed changes



regarding particular areas or specific activities will be considered together in making this determination. Cumulative impacts of changes will be considered.

The intent of field verification is to confirm inventory data and to determine the feasibility and general design and location of a unit or road, not to locate final boundaries or road locations. Minor changes are expected during implementation to better meet on-site resource management and protection objectives. Minor adjustments to unit boundaries are also likely during final layout for the purpose of improving logging system efficiency. This will usually entail adjusting the boundary to coincide with logical setting boundaries. Many of these minor changes will not present sufficient potential impacts to require any specific documentation or action to comply with applicable laws. Some minor changes may still require appropriate analysis and documentation to comply with FSH 1909.15, sec. 18.

## Right to Appeal

This decision is subject to administrative appeal. Organizations or members of the general public may appeal this decision according to Title 36 Code of Federal Regulations (CFR) part 215. The appeal must be filed within 45 days of the date that legal notification of this decision is published in the *Juneau Empire*, the official newspaper of record. The written Notice of Appeal must be filed with:

Regional Forester

Alaska Region

U.S. Department of Agriculture, Forest Service

P.O. Box 21628

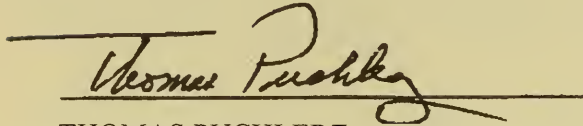
Juneau, AK 99802-1628

It is the responsibility of those who appeal a decision to provide the Regional Forester sufficient written evidence and rationale to show why the decision by the Forest Supervisor should be changed or reversed. This written Notice of Appeal must:

## Record of Decision

1. State that the document is a Notice of Appeal filed pursuant to 36 CFR Part 215;
2. List the name, address, and, if possible, the telephone number of the appellant;
3. Identify the decision document by title and subject, date of the decision, and name and title of the Responsible Official;
4. Identify the specific change(s) in the decision that the appellant seeks or portion of the decision to which the appellant objects; and
5. State how the Responsible Official's decision fails to consider comments previously provided, either before or during the comment period specified in 36 CFR 215.6 and, if applicable, how the appellant believes the decision violates law, regulation or policy.

For additional information concerning this decision, contact Chip Weber, District Ranger, Wrangell Ranger District, P.O. Box 51, Wrangell, Alaska 99929, (907) 874-2323.



THOMAS PUCHLERZ

Forest Supervisor

Tongass National Forest

7-31-03

Date

# Madan Record of Decision Map

- M-10 Unit Number  
 S Sort Yard  
 E Log Transfer Facility (LTF)

## Streams

- Class 1  
 Class 2  
 Class 3  
 Class 4

## Prescriptions

- Clear Cut (Min 10% Retention)  
 Group Selection (Min 70% Retention)  
 Indiv. Tree/Group Select (Min 70% Retention)  
 Patch Cut (Min 60% Retention)  
 Modified Old Growth Reserves  
 State Lands  
 Specified Road  
 Temporary Road  
 Specified Road (to be placed in storage after timber sale)

0 0.25 0.5 1 1.5 2 Miles  
 1 inch equals 1 miles







## **Appendix to the Record of Decision**

- 1) Non-Significant Forest Plan Amendment**
- 2) Unit Cards for Selected Alternative**
- 3) Road Cards for the Selected Alternative**



# **RECORD OF DECISION**

## **APPENDIX 1**





# Non-Significant Amendment to the Forest Plan

## Small Old-Growth Habitat Reserve Adjustments in VCU 502 & 504

Based on the project level analysis process as described in the Old-Growth Management Prescriptions and Appendix K of the Tongass National Forest Land and Resource Management Plan (1997), the Virginia Lake and Madan Small Old-Growth Reserves, located in VCU 502 and 504 in the Madan Project Area, have been adjusted to better provide size, location and habitat composition as part of the old-growth habitat reserve strategy. The location and size of the small old-growth reserves were selected before the criteria in the Forest Plan were finalized. The Madan reserve as mapped in the Forest Plan met the productive old-growth acreage requirement for small reserves, but is less than 16% of the VCU, the criteria specified in Appendix K of the Forest Plan. The Virginia Lake reserve is undersize in both criteria (productive old-growth acres and overall size), however when considered in concert with the adjacent Recreation River LUD along Porterfield Creek, the small reserve meets the criteria for productive old-growth acres. Without including Porterfield Recreation River, the Virginia Lake OGR is short 3,192 acres and the Madan OGR is short 894 acres of the optimum size.

The Secretary of Agriculture's implementing regulation indicates the determination of significance is to be "...based on an analysis of the objectives, guidelines and other contents of the forest plan" (36 CFR 219.10(f)). The Forest Service has issued guidance for determining what constitutes a "significant amendment" under the National Forest Management Act. This guidance, in Forest Service Handbook (FSH) 1909.12 - Chapter 5.32, identifies four factors to be used in determining whether a proposed change to a forest plan is significant or not significant. These four factors are (1) timing; (2) location and size; (3) goals, objectives, and outputs; and (4) management prescriptions. The Alaska Region issued a Supplement to FSH 1909.12, Chapter 5.32, effective October 17, 1990, that includes an additional factor that can be considered in determining the significance of a Forest Plan Amendment. This additional factor deals with technical changes. An analysis of the factors is presented below.

**Timing** - The Tongass Forest Plan Revision was completed in 1997. The Old-growth Habitat Management Prescription in the FOREST PLAN indicates the small mapped reserves have received differing levels of field verification and integration of site-specific information in their design. During project level environmental analysis, for

# ROD APPENDIX 1

project areas that include or are adjacent to mapped old-growth habitat reserves, the size, spacing and habitat composition of mapped reserves may be further evaluated.

**Location and Size** –The location of the Virginia Lake Small Old-Growth Reserve was adjusted to gain the required amount of Productive Old-Growth (POG) within its own boundaries (not relying on the Porterfield Recreation River LUD). On the north side of Virginia Lake adjustments were made simply to achieve desirable geographic control points, locations that are identifiable on the ground. However south and east of Virginia Lake, a large expansion occurred in order to achieve the required POG as well as desirable control points. The size of the adjusted reserve is 5,085 acres, of which 3,930 acres are classified as Productive Old-Growth.

The location of the Madan Small Old-Growth Reserve was also adjusted to gain the required amount of total acres and establish manageable control points. The northeast one-third of the original OGR was removed from OGR status and placed in Scenic Viewshed status. The remainder of the proposed OGR was expanded to the northwest removing this land from Scenic Viewshed status. The size of the adjusted reserve is 2,696 acres, of which 2,090 acres are classified as Productive Old-Growth. Additional information on old growth reserve boundary adjustments may be found in the Madan Timber Sale FEIS Chapter 3 and in the Project Planning Record.

**Goals, Objectives, and Outputs** – This factor examines whether the change alters long-term relationships between the levels of goods and services projected by the Forest Plan. In most cases, changes in outputs are not likely to be a significant change in the Forest Plan unless the change would forego the opportunity to achieve an output in later years.

**Goals** - The Forest Plan goal for Biodiversity is to maintain healthy forest ecosystems; and to maintain a mix of habitats at different spatial scales (i.e. site, watershed, island, province and forest) capable of supporting the full range of naturally occurring flora, fauna, and ecological processes native to Southeast Alaska. The adjustment to Virginia Lake and Madan Reserves are consistent with the goals of the Forest Plan.

**Objectives** - The Forest Plan objectives include: (1) to maintain a Forest-wide system of old-growth forest habitat (includes reserves, non-development LUDs, beach, estuary and riparian corridors) to sustain old-growth associated species and resources; and (2) to ensure that the reserve system meets the minimum size, spacing and composition criteria described in Appendix K of the Forest Plan. The adjustments to the Virginia Lake and Madan Reserves were specifically designed to meet the Forest Plan Objectives. Both reserves incorporate important wildlife habitat (including a known goshawk nest) and are placed in the locations recommended by the group of inter-agency biologists working on the project.



**Outputs** - Adjustment of the Virginia Lake and Madan Small Old-Growth Reserves will have a relatively minor effect on Forest Plan outputs on a Forest-wide basis. The original Virginia Lake Reserve contained 915 acres of POG, 395 of which was suitable. The original Madan Reserve contained 1,443 acres of POG, 824 of which was suitable. The new Virginia Lake Reserve contains 3,930 acres of POG, 1,167 acres of which is suitable timber. The new Madan Reserve contains 2,090 acres of POG, 1,176 of which is suitable. The net combined reduction of suitable POG from the overall timber base from both Old-Growth Reserves is 1,124 acres.

**Management Prescriptions** – This factor accounts for whether the change in a management prescription is only for a specific situation or whether it would apply to future decisions throughout the planning area. It evaluates how the change alters the desired future condition of the land and resources or the anticipated goods and services to be produced.

None of the standards and guidelines associated with the Management Prescriptions has been changed as a result of this amendment. The changes to the two mapped small Old-Growth Habitat Reserves apply only to this specific situation. These changes also would apply to future modifications being made so long as the standards and guidelines for the management prescription are achieved. The proposed amendment fulfills the desired future condition for the Old-Growth Habitat LUD Management Prescription as defined in the Forest Plan and would not significantly affect the goods and services produced.

**Technical Changes** - Technical changes to a Plan's management direction may be made on the basis of new information about the actual resource characteristics of the area. This category does not apply in this case.

**Cumulative Changes** – The Madan Timber Sale EIS is one of 17 National Environmental Policy Act (NEPA) decisions as of August 2003 (projected decision date), to make non-significant amendments to the Tongass Forest Plan by modifying LUD boundaries. These changes are tracked with a monitoring question posed by the Forest Plan and are part of the Annual Monitoring and Evaluation Report.

The Niblack Environmental Assessment changed a Wild River non-development LUD to Old-Growth Habitat and Timber Management LUDs. The other amendments involved enlargement or reduction of Old-Growth Habitat LUDs, usually exchanging acres with one of the resource development LUDs in order to more effectively meet Forest Plan objectives. Usually, wherever an Old-Growth Habitat LUD was expanded, it caused a corresponding reduction of acres suitable for timber harvest. Likewise, an Old-Growth Habitat LUD size reduction usually meant an increase in suitable acres. Often non-forest or low-productive forest land is included in the modification of the shape of a small old-growth habitat reserve due to the natural fragmentation of the forest in Southeast Alaska.



# ROD APPENDIX 1

While LUD changes within each project decision constituted non-significant Forest Plan amendments, Table A1-1 displays the accumulated effect on suitable acres for all projects. For each project the table displays suitable acres changed from a non-development LUD to a resource development LUD, or from a development LUD to Old-Growth Habitat and the net change in acres suitable for timber management. The net change in suitable acres represents less than two percent of the suitable land base.

Table A1-1.

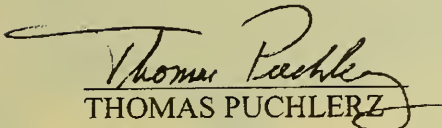
## Effects of Forest Plan Amendments on Acres Suitable for Timber Harvest as of May, 2003

Project	Non-Development to Development LUD	Development to Non-development LUD	Net Change in Suitable Acres
Madan EIS	377	1,501	-1,124
Finger Mountain EIS	0	593	-593
Cholmondely EIS	894	6,873	-5,979
Woodpecker EIS	180	130	+50
Salty EA	99	126	-27
Luck Lake EIS	257	794	-537
Polk Small Sales EA	0	153	-153
Doughnut EA	0	19	-19
Kuakan EIS	416	542	-126
Sea Level EIS	185	500	-315
Canal Hoya EIS	0	151	-151
Chasina EIS	0	78	-78
Control Lake EIS	446	142	+304
Crystal Creek EIS	481	1,153	-672
Nemo Loop EA	177	932	-755
Todahl Backline EA	2	363	-361
Fire Cove Salvage EA	186	633	-447
Niblack EA	252	0	+252
Total =	3,952	14,683	-10,731

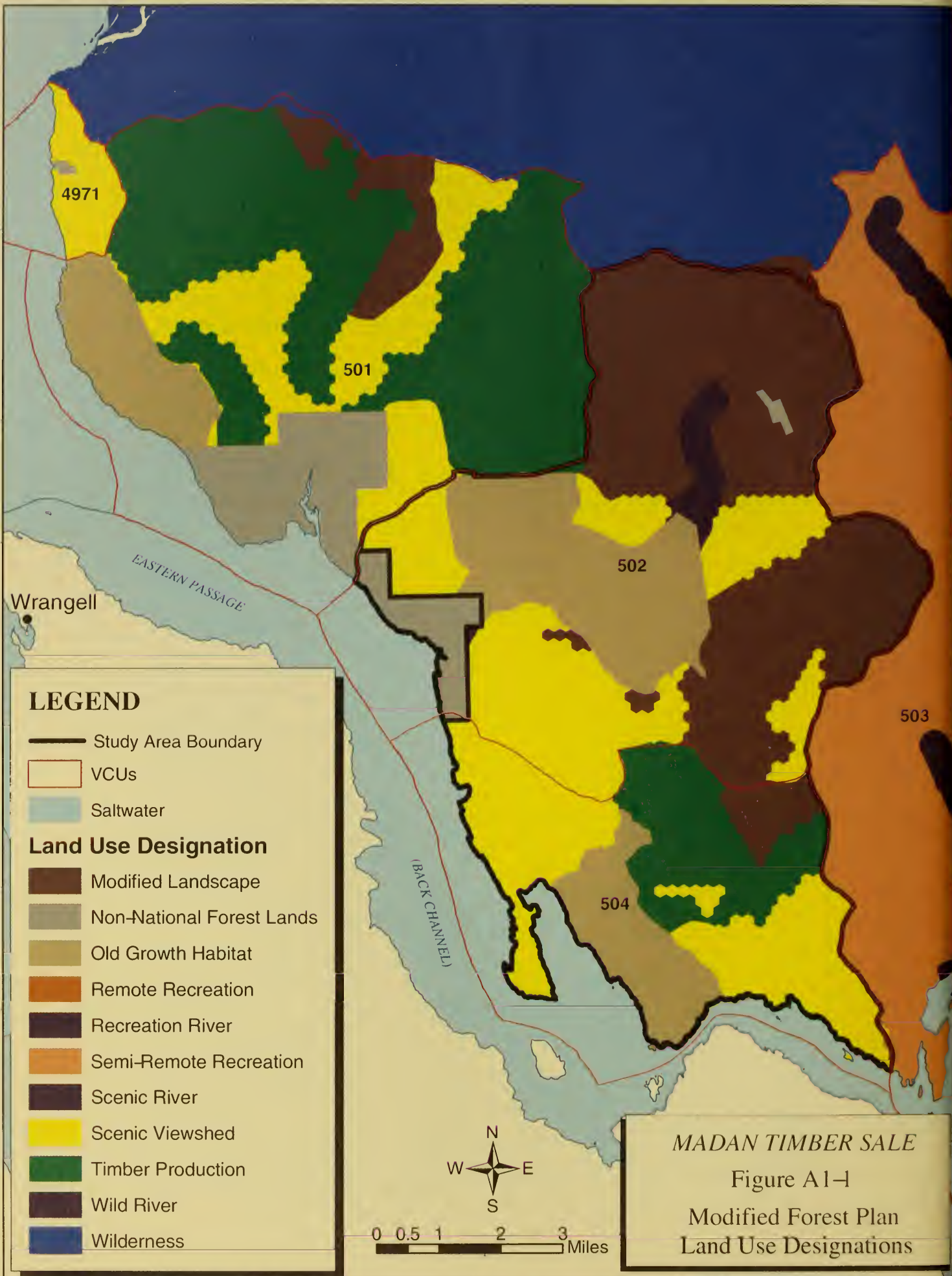
Source: 2001 Monitoring Report and GIS Analysis.

**Conclusion** - Based on a consideration of the factors above, I conclude adoption of this amendment is not significant in a National Forest Management Act context. This amendment is fully consistent with the current Forest Plan goals and objectives. The amendment provides added detail on implementation of the Old-Growth Habitat Management Prescriptions of the Forest Plan.

I hereby amend the Forest Plan with this non-significant amendment by adjusting the Virginia Lake and Madan Small Old-Growth Reserves as shown on the Madan Record of Decision Map and documented in the project planning record for the Madan Project Area Final EIS (see Figure A1-1).

  
 THOMAS PUCHLERZ  
 Forest Supervisor

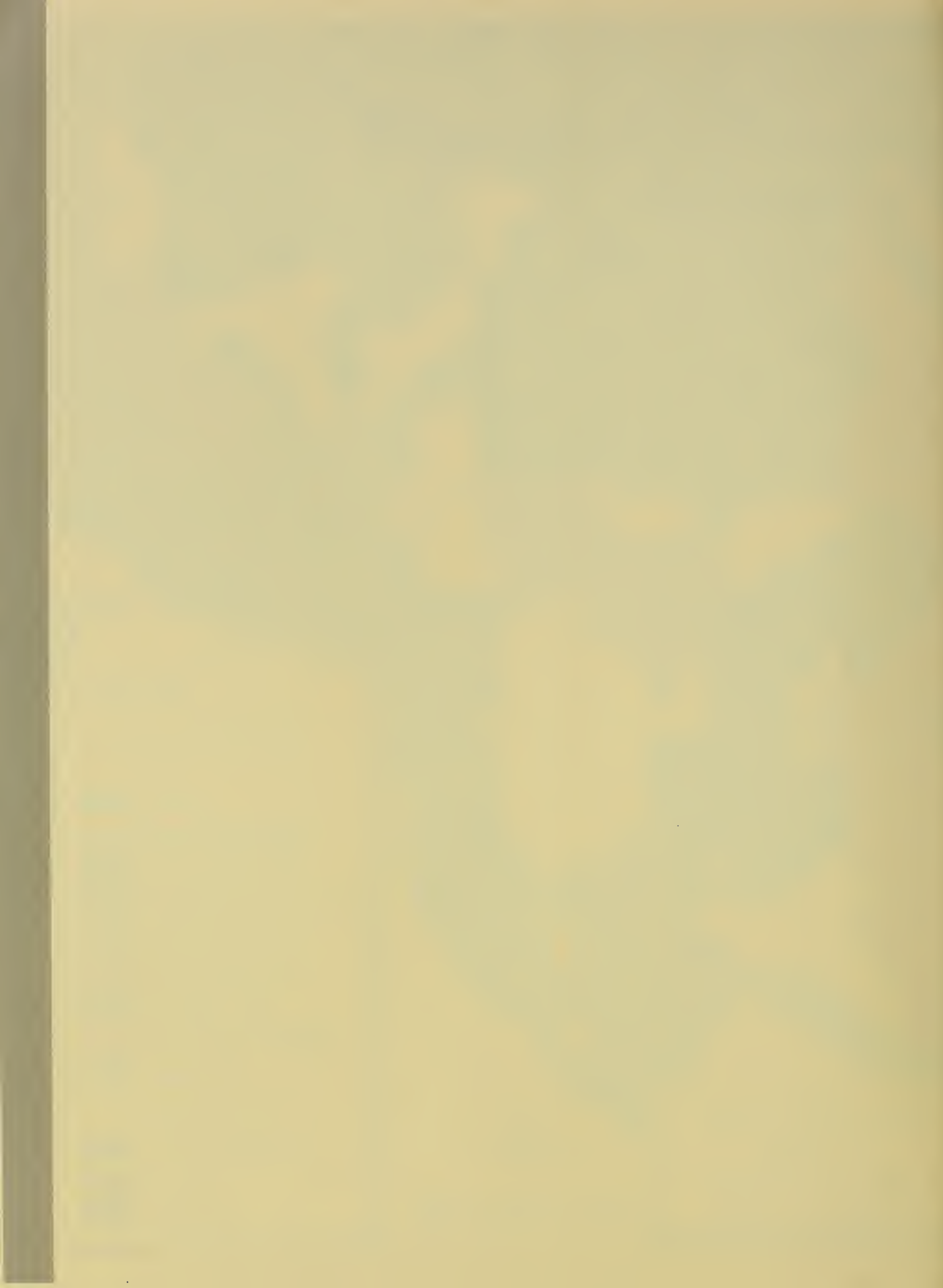
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# **RECORD OF DECISION**

## **APPENDIX 2**



# **RECORD OF DECISION**

## **APPENDIX 2 - UNIT CARDS**





# Unit Cards

The unit cards and road cards in Appendix 2 and Appendix 3 are used to explain site-specific information about each unit and road segment and any resource concerns and mitigation.

Appendix 2, Unit Cards, displays narrative cards and maps for the proposed harvest units in the Selected Alternative, in numerical order. Each narrative card and accompanying map displays the site-specific silvicultural prescriptions, resource concerns, and mitigation for the unit. Appendix 3, Road Cards, displays narrative cards and maps for the proposed roads in the Selected Alternative, which include the management objectives for each segment of road. The road cards are also in numerical order.

For a comprehensive picture of the proposed units and roads for the Selected Alternative, refer to the fold-out map at the end of the Record of Decision.

The following section is background information for the unit and road cards. This includes more detailed resource information, and the mitigation measures that can be used to address resource concerns. These mitigation measures can be either from the Forest Plan or project-specific.

## Resource Information

### Silvicultural Prescriptions

Silvicultural prescriptions have been developed to meet the management objectives based on each site and the Forest Plan direction. These objectives may include retaining old-growth characteristics for biodiversity, protection of soils, watershed, wildlife habitat or scenery values or designing systems that are most economical for logging feasibility on a site.

Silvicultural prescriptions will include these unit cards as well as sale layout and marking guidelines for each unit that is included in the Madan Timber Sale Record of Decision. Minor changes to boundary layout and to the prescriptions are expected during implementation to better meet on-site conditions. The harvest treatment descriptions on the unit cards are basic guidelines to achieve the desired stand structure and logging system operability, and address resource concerns. Two categories of silvicultural systems used in the Madan Project and some of the prescriptions that may achieve the desired results are described below:

- **Uneven-aged Management:** A system that is used to maintain high forest cover, regeneration of desirable species, and development of trees through a range of diameter or age classes. Prescriptions to obtain this structure include single-tree selection and group selection. Approximately 70 percent of the basal area of trees will be retained on these units.
- **Even-aged Management:** Most merchantable trees would be harvested. The objective is to create a fast-growing stand of trees to maximize wood fiber production. In the Madan Project, approximately 10 percent of the trees over 9 inches dbh would be retained as a biological legacy. The stand would regenerate into a mostly single-aged stand. In some instances, trees are left in

the unit to promote regeneration of a specified species. This type of prescription is called Seed Tree.

## Watersheds and Fisheries

All known streams are shown on the unit card maps. These streams and any additional streams found during layout will be protected by following the Forest Plan Riparian Standards and Guidelines listed below. Class IV streams will be protected by following Best Management Practices (BMPs). Timing restrictions for instream work are listed on the road cards.

### Process Groups and Channel Types

A process group describes streams with similar interrelationships between watershed runoff, landform relief, geology, and glacial or tidal influences on erosion and deposition. A channel type more precisely characterizes a stream and helps predict the probable responses to natural and human influences. Channel types incorporate other aspects such as gradient, pattern, stream bank incision and containment and riparian area vegetation communities. See the Forest Plan, Figure D-1 (page D-4) for a visual representation of the typical distribution of channel process groups. Each unit card summarizes the protection. Only the channel types found in the Madan project area are listed.

### Riparian Management Areas (RMAs)

Stream buffers maintain biodiversity and productivity, streambank and stream channel processes and functions, the recruitment of large woody debris into the stream channel, and the beneficial uses of water quality over the short and long term. Riparian Management Areas are areas of special concern to fish, other aquatic resources and wildlife. Riparian areas also include wetland soils and vegetation adjacent to streams. They are delineated according to the Forest Plan, Chapter 4, Riparian Standards and Guidelines (RIP2, III, E).

### Riparian Standards and Guidelines for Timber Harvest

The Tongass Timber Reform Act (TTRA) mandates leaving minimum 100-foot wide buffer strips along both sides of all Class I and Class II streams that flow into Class I streams. This was incorporated into the Forest Plan Standards and Guidelines as “No commercial harvest within 100 feet of Class I streams and Class II streams that flow into Class I streams.”

### Reasonable Assurance of Windfirmness

For Floodplain (FP), Alluvial Fan (AF), High Gradient Contained (HC), Low Gradient Contained (LC), Moderate Gradient Contained (MC), Moderate Gradient/Mixed Control (MM), and Palustrian (PA) areas, manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area). Site-potential tree heights vary according to the process groups as follows:

- Floodplain - 130 feet,
- Alluvial Fan - 140 feet,
- High Gradient Contained - 120 feet,
- Low Gradient Contained - 100 feet,
- Moderate Gradient Contained - 100 feet,
- Moderate Gradient/Mixed Control - 120 feet, and
- Palustrian - 85 feet.



Table A1-1.  
Channel Types in the Madan Project Area

Process Group	Channel Type Code <sup>1</sup>	Channel Type Description
Alluvial Fan (AF)	AF1	Moderate gradient alluvial fan channel
	AF2	High gradient alluvial cone channel
Flood Plain (FP)	FP3	Low gradient, channel width less than 10 meters
	FP4	Low gradient, channel width 10-20 meters
Low Gradient Contained (LC)	LC1	Incision less than 10 meters
	LC2	Incision greater than 10 meters
High Gradient Contained (HC)	HC1	Shallowly incised muskeg channel
	HC2	Shallowly to moderately incised footslope channel
	HC3	Deeply incised upper valley channel
	HC4 <sup>1</sup>	Deeply incised muskeg channel
	HC5	Shallowly incised high gradient channel
	HC6	Deeply incised high gradient channel
Moderate Gradient Contained (MC)	MC1	Narrow, shallow contained channel
	MC2	Moderate width and incision contained channel
	MC3	Deeply incised contained channel
Moderate Gradient, Mixed Control (MM)	MM1	Narrow mixed control channel
	MM2	Moderate width, mixed control channel
Palustrine (PA)	PA1	Narrow, placid flow channel
	PA2	Moderate width, placid flow channel
	PA5	Beaver dam/pond channel

<sup>1</sup>Channel Types ending in zero indicate the presence of a "small channel type stream segment". This new channel classification has been created to map streams that exhibit smaller incision and bankfull-width channel characteristics than identified by the standard Region 10 stream channel classification system. These channel types incorporate the same process group header followed by a zero to indicate the smaller channel type.

## Visual Quality Objectives

The following visual quality objectives from the Forest Plan provide standards for management, based on the landscape's scenic characteristics and public viewing concern.

- **Partial Retention:** Changes in the landscape may be visually evident, but must be integrated into and visually subordinate to the surrounding landscape and should not attract attention.

- Modification: Changes in the landscape may visually dominate the surrounding natural landscape; however they should be compatible with the surrounding landscape.
- Maximum Modification: Management activities may visually dominate the characteristic or surrounding landscape.

### Scenery Standards and Guidelines by LUD

The guidelines for scenery differ between the three main Land Use Designations (LUDs) in the project area that allow timber harvest.

<u>Distance Zone</u>	<u>Scenic Viewshed</u>	<u>Modified Landscape</u>	<u>Timber Management</u>
<u>For areas visible from Visual Priority Travel Routes and Use Areas:</u>			
Foreground (0-1/2 miles)	Retention	Partial Retention	Modification
Middleground (1/2 – 3 to 5 miles)	Partial Retention	Modification	Maximum Modification
Background (3 to 5 miles and greater)	Partial Retention	Modification	Maximum Modification
<u>For areas not visible from Visual Priority Travel Routes:</u>			
All areas	Maximum Modification	Maximum Modification	Maximum Modification

The primary scenic objective for the Scenic Viewshed LUD is to manage areas to maintain scenic quality as seen from Visual Priority Travel Routes and Use Areas. In the Modified Landscape LUD the primary scenic objective is to design management activities that, though clearly visible, blend in with the features of the natural landscapes when viewed from Visual Priority Travel Routes and Use Areas. In the Timber Production LUD, management activities may clearly dominate the natural landscape character, but still mimic some visual features of the surrounding landscape while allowing a sustained yield of timber. The majority of the units in the selected alternative are managed for partial retention.

## General Mitigation Measures

These general measures apply to all units and roads in the Madan project. The source(s) of each general measure are listed after the measure in terms of individual Forest-wide Standards and Guidelines (see Chapter 4 of the Forest Plan) or BMPs (see Appendix C of the Forest Plan and Chapter 10 of FSH 2509.22, The Soil and Water Conservation Handbook).

### Air Quality Protection

Design projects to control air pollution impacts and to ensure that the predicted emissions from all pollution sources do not exceed ambient air quality standards, as specified under the Alaska Administration Code, Title 18, Chapter 50. (AIR-112)

### Soil/Water Protection during Timber Sale Planning

Incorporate soil and water resource considerations into timber sale planning. These considerations include:

- site-specific considerations,
- site preparation,
- designating water quality protection needs on sale area maps,
- locating and designing landings for good drainage and dispersion of water,
- incorporating erosion control and timing responsibilities into the Operating Schedule,
- scheduling and enforcement of erosion control during and at completion of the timber sale, including non-recurring "C" provisions to protect soil and water resources in timber sale contracts, and
- seeking an environmental modification of the contract if new circumstances or conditions indicate that soil, water, or watershed damage may occur.

(BMPs 13.1, 13.2, 13.3, 13.4, 13.9, 13.10, 13.11, 13.12, 13.14, 13.17, and 13.18)

### **Soil/Water Protection during Road Development**

Implement measures to reduce surface erosion and drainage interruption related to transportation. This includes water barring and cross-draining roads using ditches and culverts to prevent water running long distances over roads, closure, and seeding and fertilizing cut-and-fill slopes. (BMPs 14.1, 14.2, 14.3, 14.5, 14.7, 14.8, 14.9, 14.10, 14.11, 14.12, and 14.19)

### **Soil/Water Protection during Road Management**

Conduct road maintenance and snow removal operations to minimize disruption of road surfaces, embankments, ditches, and drainage facilities, and use road closures or other measures to keep road surface and road site erosion at low or background levels. (TRAN23-I, BMPs 14.20 and 14.23)

### **Management of Road Use to Reduce Erosion and Sedimentation**

Control access and manage road use to reduce the risk of erosion and sedimentation from road surface disturbance especially during the higher risk periods associated with high runoff and spring thaw conditions. (BMP 14.22)

### **Temporary Road Obliteration**

Obliterate temporary roads after use, remove or bypass drainage structures and install waterbars in appropriate places. (RIP2-II and BMPs 12.17 and 14.24)

### **Soil/Water Protection during Development of Rock Sources, LTFs, & Other Facilities**

Implement measures to reduce surface erosion and other impacts on soils and water from gravel sources and quarries, LTFs, sortyards, and other facilities. (BMPs 14.18, 14.19, 14.25, 14.26, and 14.27)

### **LTF Siting**

Site LTFs in locations which will best avoid or minimize potential impacts on water quality, aquatic habitat, wildlife, and other resources. (TRAN214-V, WILD112, and BMP 14.4)



## **Camp and Facility Siting**

Site camps and other facilities sufficiently far from important seasonal bear concentrations, raptor nest sites, and other important wildlife habitats, to avoid or minimize wildlife-human conflicts. (WILD112).

## **Sanitation at Facilities**

Comply with all regulations for the disposal of sewage at camps, LTFs, and other facilities; require incinerators and/or other bear-proof garbage disposal methods at work camps. (FAC1, FAC22, WILD112-VI, BMPs 12.10, 12.15, and 12.16)

## **Accidental Spills**

Implement measures and plans to prevent the contamination of soil and water from accidental spills of petroleum products and hazardous substances. (BMPs 12.8 and 12.9)

## **Heritage Site Discovery**

Suspend work if a heritage site is discovered during project implementation. Authorize resumption of work only after consultation with the State Historic Preservation Office is complete.

## **Karst/Cave Inventory**

Inventory karst landscapes and cave resources prior to initiation of project planning (including the use of dye tracing). (KARST-III)

## **Maximum Size of Created Openings**

Limit created openings to a maximum size of 100 acres. (TIM114-IV)

## **Maintain Advance Regeneration**

Maintain advance regeneration within the unit to meet reforestation needs and stand objectives. (TIM111-2-I)

## **Maintain Minor Tree Species**

Selectively maintain minor species (e.g., yellow-cedar, western redcedar, Pacific yew), where appropriate for the site, as viable components of future stand, for vegetative diversity, and for seed trees. (TIM111-2-I, TIM114-II)

## **Windthrow Hazards Along the Boundaries of Protected LUDs**

Take measures that protect LUDs which prohibit timber harvest activities from harvest-related windthrow. (TIM114-XII)

## **Certification of Reforestation**

Certify that every unit that receives a final harvest meets or surpasses the stocking guidelines and certification standards (FSH 2409.17) within 5 years. (TIM24)

### **Wetland Protection**

Minimize the loss of all wetlands, but particularly the higher-value wetlands (especially fens), and minimize the adverse impacts of land management activities on wetlands; follow Executive Order 11990 and the BMPs. (WET-I, WET-III, BMP 12.5)

### **Beach and Estuary Fringe Protection**

Avoid harvest within the beach and estuary fringe; avoid road construction within this zone, except where no feasible alternative exists. (BEACH 2)

### **Non-Development LUD Protection**

Avoid timber harvest impacts and minimize road construction within non-development LUDs such as Old-growth Habitat, Remote and Semi-remote Recreation, and Wild and Scenic River corridors.

### **Connectivity Between Old Growth Reserves**

Provide corridors of old-growth forest between and among medium and large old-growth reserves. Where sufficient connectivity does not exist, or where the minimum Forest Plan criteria are not met, relocate or redesign mapped, small old-growth reserves. (WILD112-XVIII)

### **Marine Mammal Protection**

Ensure that Forest Service permitted or approved activities are conducted in a manner consistent with the Marine Mammal Protection Act, the Endangered Species Act, and National Marine Fisheries Service regulations for approaching whales, dolphins, porpoises, seals, and sea lions. Site camps, LTFs, and other facilities are to be located at least 1 mile away from known Steller sea lion haulouts. (TE&S-I)

## **Site-specific Mitigation Measures Incorporated into Unit and Road Design**

The specific mitigation measures that are applied to selected units and/or roads are identified in this section. Listed below is a summary of the Forest Plan Mitigation Measures. The source(s) of each general measure are listed after the measure in terms of individual Forest Plan standards and guidelines (see Chapter 4 of the Forest Plan) or BMPs (see Appendix C of the Forest Plan and Chapter 10 of FSH 2509.22, Region Soil and Water Conservation Handbook). Summary tables (E-1 and E-2) showing the units and roads to which the specific measures apply are located at the end of this appendix.

### **Karst and Cave Resources**

**K1 Avoid Effects on Karst/Cave Features:** Avoid road construction or modify harvest unit design to avoid impacts on karst or cave features. (KARST - III4)

**K3 Other Specific Protection Measures for Karst/Cave Features:** Develop site-specific protective measures for karst and cave features. (KARST - III4)

## Fish, Water, and Soils

**F1 Riparian Buffers:** Establish no-harvest and selective cut buffers along streams and around lakes to protect riparian areas as defined by the Riparian Standards and Guidelines. Protect buffers from adjacent harvest activities (e.g., directional felling, split yarding, suspension requirements). (RIP2, BMP 12.6)

**F2 Directional Felling Along Buffers:** Trees identified for harvest will be felled to avoid riparian areas designated for “no commercial harvest” and stream courses. (RIP2-II)

**F3 Class III/IV Stream Protection:** Split yard and directionally fall trees away from Class IV streams without buffers. (RIP2-II)

**F4 Yarding Across Streams:** Directionally fall and fully suspend logs where yarding is to be done across streams or the full length of a stream or drainage. (RIP2-II)

**F5 Fish Passage:** Maintain fish passage at Class I and II stream road crossings using properly designed stream crossing structures (consult the Aquatic Habitat Management Handbook, FSH 2609.24). (FISH112-IV)

**F6 Use of Bridges:** Install bridges at designated stream crossings to minimize the amount of sediment entering streams and/or to ensure good fish passage (TRAN 214-II)

**F8 Siting of Road-Stream Crossings:** Modify the location of road-stream crossings to correspond with stable stream reaches. (TRAN214-II)

**F9 Routing of Roads near Streams:** Modify road routes to avoid locations near fish-bearing streams. (TRAN214-II)

**F10 Routing of Roads through Wetlands and Other Sensitive Areas:** Modify location of Forest Development Roads to minimize impact to wetlands, floodplains, estuaries, and tidal meadows. (TRAN214-III)

**F11 Harvesting Timber in/near Wetlands and Floodplains:** Modify unit design or logging system to avoid or minimize damage to muskegs, other wetlands, or floodplains. (S&W112-I, BMP 12.4 and 12.5)

**F13 Stormproofing Roads:** Design system roads with oversized culverts, outfall riprap, armored dips adjacent to culverts, substantial ditch blocks, drivable waterbars, and/or other measures to prevent culvert failure or erosion during periods of inactivity. (TRAN22-I)

**F15 Avoid Harvesting High Hazard Soils:** Modify unit design to avoid very high mass movement areas, including slopes greater than 72 percent. (S&W112-I, BMP 13.5)

**F16 Soil/Water Protection along Roads on Very High Hazard Soils:** Where avoidance of road construction along unstable slopes is not possible, take special precautions with fill to prevent soil erosion, stream sedimentation, and mass wasting or require full bench construction and end hauling of excavated material. (S&W112-I, TRAN 214-II, and BMP 14.7)



**F17 Soil/Water Protection along Roads on High Hazard Soils:** Where avoidance of road construction along unstable slopes is not possible, take special precautions with fill to prevent soil erosion, stream sedimentation, and mass wasting or require full bench construction and end hauling of excavated material. (S&W112-I, TRAN 214-II, and BMP 14.7)

**F18 Suspension Requirements to Protect Soils:** Use partial- to full-suspension logging systems in areas with high mass movement potential or McGilvery soils. (S&W112-I, BMP 13.9)

## **Timber**

**T1 Maintain Advanced Regeneration:** Maintain advanced regeneration within the units to meet reforestation needs and stand objectives. (TIM111-2-I)

## **Wildlife and Threatened/Endangered/Sensitive Species**

**W1 Provide Habitat Diversity by Using the Clearcutting with Reserves System:** Provide for greater habitat diversity on a stand level over time by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112 - III)

**W5 Patch or Strip Clearcutting:** Provide for greater habitat diversity on a stand level over time by using patch or strip clearcutting (two-aged or uneven-aged systems) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112-III)

**W6 Provide Habitat Diversity by Using the Uneven-aged Harvest System:** Provide for greater habitat diversity on a stand level over time by using the selection method (uneven-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112 - III)

**W7 Leaving Nonmerchantable Trees and Snags:** Provide for greater habitat diversity on a stand level over time by leaving most nonmerchantable trees and snags after harvest. (WILD112 - III)

**W8 Restrictions on Helicopter Yarding:** Modify helicopter yarding routes and/or timing of helicopter activity to avoid important wildlife habitats (active bald eagle nest sites). (WILD112-XII)

**W9 Road Closures:** Close roads to motorized use to protect wolves and other species from over harvest. (WILD112)

**W13 Protection of Bald Eagle Nest Trees/Other Sites and Timing of Activities:** Avoid all activity, modify unit or road design, and/or limit timing of activities, near bald eagle nest trees, perch trees, and winter roost sites in accordance with the Interagency Agreement established with the USFWS. (WILD112-V)

**W31 Protection of Sensitive Plant Species:** Modify unit boundaries or road routing to avoid habitats supporting populations of sensitive plant species. (TE&S-II)

## **Recreation and Tourism**

**R1 Access Restrictions for Recreation:** Close or restrict access on roads to maintain remoteness of areas after harvest. (REC112-II)

## Scenery

**V1 Meet Visual Resource Objectives by Using the Clearcutting with Reserves System:** Reduce visual contrast with adjacent areas by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11 - III)

**V5 Patch/Strip Clearcutting:** Reduce visual contrast with adjacent areas by using patch or strip clearcutting (two-aged or uneven-aged systems) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11-III)

**V6 Meet Visual Resource Objectives by Using the Uneven-aged Harvest System:** Reduce visual contrast with adjacent areas by using the selection method (uneven-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11 - III)

**V7 Leaving Nonmerchantable Trees:** Reduce visual contrast with adjacent areas by leaving most nonmerchantable trees after harvest. (VIS11 - III)

**V8 Modification of Unit Boundaries:** Modify unit boundaries to ensure that the harvest unit meets the proposed VQO in partial retention and retention areas. (VIS11-II)

**V11 LTF Design:** Use low profile LTF design to minimize visibility from Visual Priority Travel Routes and Use Areas. (VIS11-II)

**V13 Landscape Architect Review:** Use landscape architect for review of final layout to ensure that VQO will be met.

## Unit Cards

Unit cards are used to explain site-specific information about each unit. The units are displayed in numerical order. Each narrative card and accompanying map displays the site-specific silvicultural prescriptions, resource concerns, and mitigation for the unit. For a comprehensive picture of the proposed units and roads for the Selected Alternative, refer to the fold-out map at the end of the Record of Decision.

### Narratives

The general measures described in the Introduction apply to all units in the Madan project. Site-specific measures to be applied to a particular unit are listed in the individual unit card narrative, under the appropriate resource of concern.

### Maps

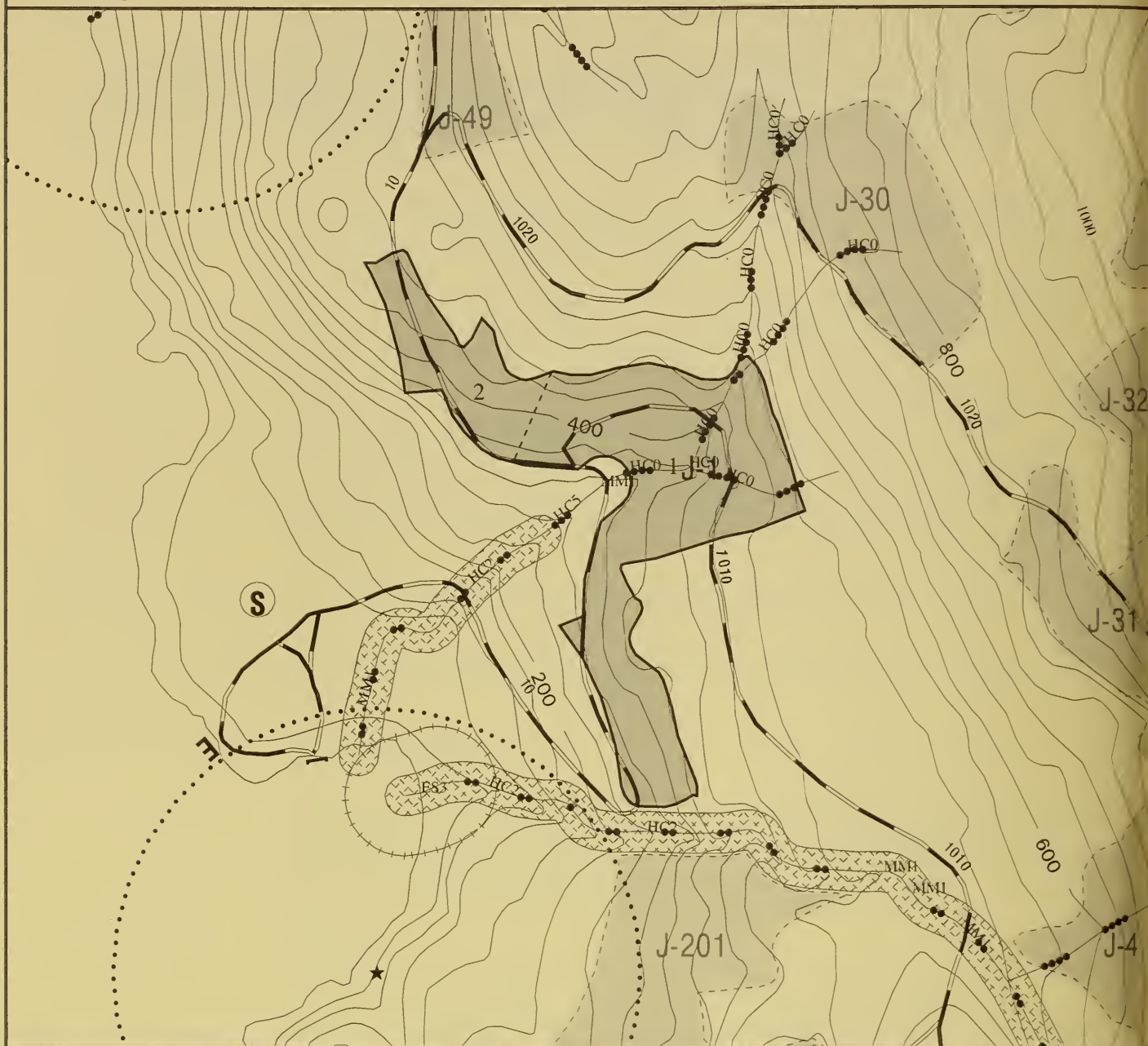
The unit card maps show resource information to support the narrative discussion. Because not everything can be shown on the maps, resources of particular concern for management were selected. These include stream classes and riparian buffers, slopes exceeding 72 percent, mass movement index 4 (MMI4) soils, TTRA buffers, eagle nest trees, setting locations and potential helicopter landings. In some instances, slopes exceeding 72 percent may be discussed in the unit card narration but are not shown on the map – this is because GIS did not identify the presence of small inclusions of 72 percent slopes that were discovered in an on-site visit by the soils scientist.

One Madan harvest unit is highlighted on each map. Adjacent Madan units are outlined on the map as “Proposed Action Unit”; they are not numbered.

### **Roads**

Near the latter stages of project planning on the Madan FEIS, road terminology changed in regard to specified and temporary road. As referenced throughout this document; Specified road is now termed Classified road and Temporary road is now Unclassified road.





- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- Proposed LTF Sites
- Channel Types

Potential Helicopter Landings

Other Landings

Very High Hazard Soils (MM14)

300' Offset From Class 1 Streams

Second Growth

Sort Yards

Eagle Nest Tree

Proposed cut units

Adjacent proposed units

TTRA Buffers

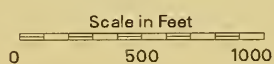
1/4 Mile Eagle Nest Timing Buffers

Setting

State/Private Land

Lakes

Scale: 1" = 800 ft



**MADAN TIMBER SALE - UNIT CARD**Unit Number J-1

Selected Alternative

Harvest Method: Running SkylineTotal Acres: 39Total Volume: 694 MFBVolume per Acre: 18 MFB**UNIT DEVELOPMENT**

Unit designed to meet Visual Quality Objective of partial retention. Southeastern boundary was modified in the field due to unsuitable timber and small area of organic soil. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, T1, W1, W7, V1, V7, V8, and V13. These measures are described below within the resource sections that apply. Two mitigation measures, R1 and W9, would only apply under road management Option B.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration on both settings using the roads as continuous road-side landings. Portions of the unit can be shovel yarded. Deflection is good. Tailholds are poor and multiple-stump anchors will be necessary. A 1000' ocean buffer was placed at the northwest and southwest portions of the unit. Two Class IV streams in center of unit can be split-yarded and require directional felling. The class IV streams combine into a class III below the road, which can also be split-yarded and require directional felling. A class II V-notch stream on the south boundary and has the greater of a 100' or top of bank buffer (BMP 12.6(a), 13.16). The timber is highly defective, old and low value and contains little windthrown timber; no blowdown problems are expected after harvest. The unit has visual concerns from the west; See Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 10 road and the 1010 road. Consider moving the 10 road uphill 50' in the southern portion of unit.

**Temporary Roads:** A < 100' long temporary road is needed west of the 10 road in the north section.

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve trees (estimated harvest volume = 625 MBF). Leave scattered and clumped trees and snags and non-merchantable trees within 50-100 feet of the unit/setting boundaries. Leave a higher percentage of reserve trees on visible boundaries and a lower percentage on non-seen edges. Due to visual concerns special methods are needed. See Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

## RESOURCE CONCERNS & MITIGATION

### **Watershed/Fisheries**

**Concern:** Unit contains Class IV (HC0) streams flowing into un-named (non-TTRA) Class II stream entering north side of Jenkins Cove. South unit boundary borders Class II Jenkins Creek (HC2). Verification Update: Stream locations and classifications verified after initial unit reconnaissance. Resident fish verified 1,000 feet downstream of unit (un-named stream).

**Mitigation:** Provide full suspension wherever possible across Class IV streams, at least partial suspension is required. Unit provides at least 100-foot (TTRA) no-harvest buffer adjacent to Jenkins Creek, excluding sideslope (BMPs 12.6, 12.6a, 13.9, 13.16).

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### **Soils/Wetlands/Karst**

**Concern:** Small area of organic soils with poor timber quality along the mid-southeastern boundary.

**Mitigation:** Removed the wet area from the unit.

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### **Wildlife/TES Plants**

**Concern:** Unit contains high deer HSI values in southern portion of unit. High probability goshawk nesting habitat occurs in the southern portion of unit. Eagle timing restriction may apply near unit on Road 10 (see Road Card).

**Mitigation:** Leave reserve and non-merchantable trees in southern portion of unit when possible.

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### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in areas of unit seen from saltwater (along the eastern border of the northern and central lobes of the unit). Timber west and downhill of unit will screen most of the unit from saltwater.

**Mitigation:** Locate logging corridors so that they are not visible from Jenkins Cove. Vary and feather edges of unit (especially visible portions of northern and eastern edges) to give unit a more natural appearance. No straight lines along edges. Leave a higher percentage of reserve trees within 50-100 feet of visible boundaries, than in unseen areas. Unit needs a review by a landscape architect during final layout to make sure that layout will achieve the VQO of partial retention.

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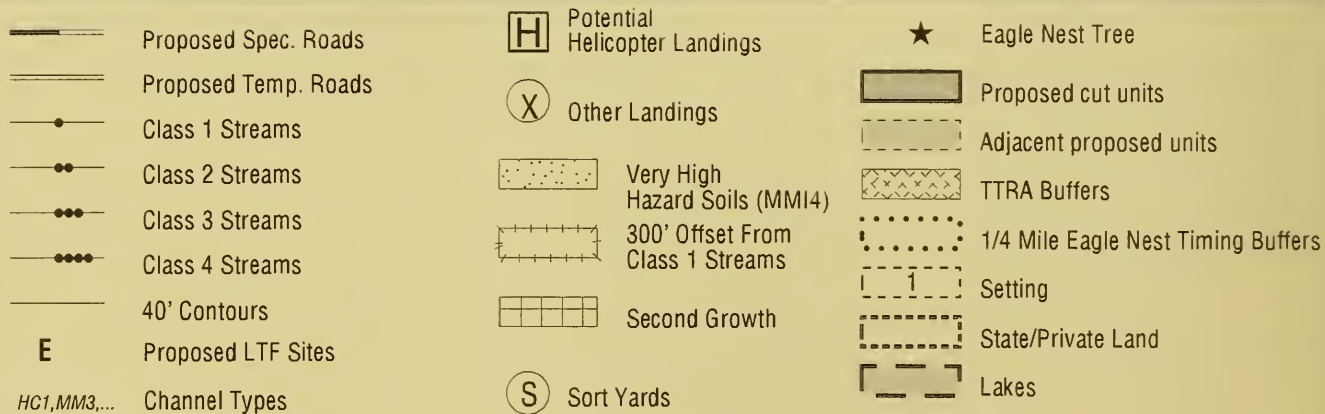
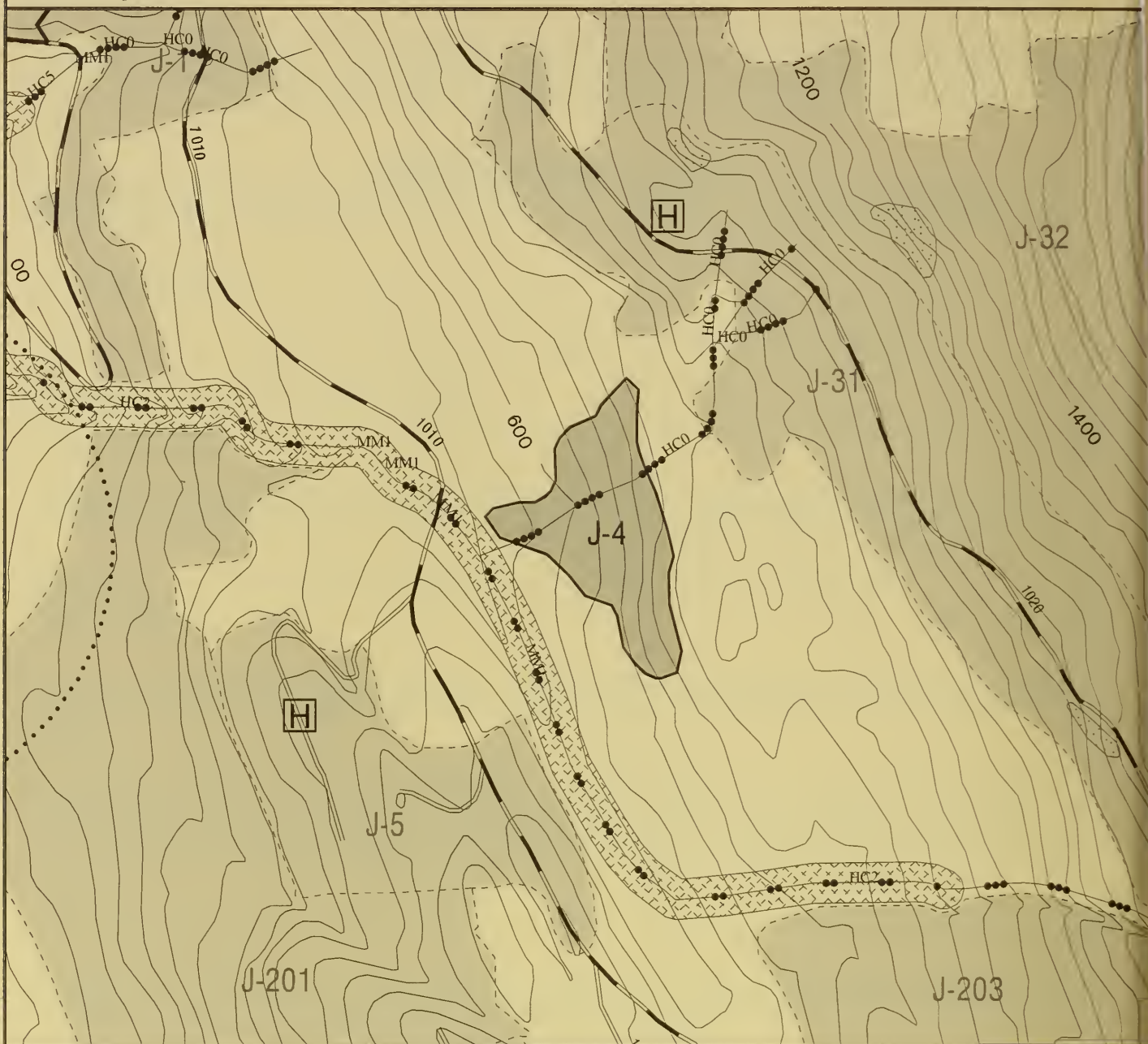
### **Other Resources/Issues**

**Concern:** Unit was inventoried for cultural resources although the unit is outside of high probability areas. Culturally Modified Tree (blaze) was located and recorded near northwestern boundary.

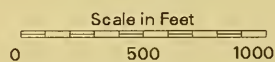
**Mitigation:** No further cultural resource work recommended.



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Scale: 1" = 800 ft



Harvest Method: Helicopter (cable is possible)

Total Acres: 15 Total Volume: 264 MBF

Volume per Acre: 18 MBF

#### UNIT DEVELOPMENT

Unit was field verified after initial design. Boundaries correspond with mapped suitability timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:** The timber can be helicopter yarded to the Jenkins Cove LTF (Alt. 4 yarding distance = 1.0 miles), or to the 1010 road in J-5 (Alt. 3 yarding distance = 0.5 miles). A Class II stream exists on the western tip of the unit, which will need a buffer and directional felling (BMP 12.6(a), 13.16). The remaining boundaries are intended to be at the limit of merchantable timber. This unit could likely be yarded using conventional logging systems if roads were planned. This unit has visual concerns from the west; see Visual/Recreation section.

**Specified Roads:** The timber can be helicopter yarded to the 1010 Alt. 3, or the Jenkins Cove LTF for Alt. 4.

**Temporary Roads:** This unit would need a temporary road if conventionally logged.

**Stand Management Objectives:** Future stand will be a mosaic of small areas of different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 66 MBF). Harvest individual trees and/or groups up to 2 acres scattered throughout the unit. Leave a higher percentage of reserve trees on visible boundaries and a lower percentage on non-seen edges. This prescription would address visual and other resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees compared with clearcutting. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

#### RESOURCE CONCERNS & MITIGATION

##### **Watershed/Fisheries**

**Concern:** Unit contains Class IV (HC0) stream flowing into Jenkins Creek (MM1).

**Mitigation:** Unit provides 120-foot (TTRA) buffer adjacent to Jenkins Creek. Provide full suspension wherever possible across Class IV stream, at least partial suspension is required (BMPs 12.6, 12.6a, 13.9, 13.16). Fisheries personnel will assist in final layout.

##### **Soils/Wetlands/Karst**

**Concern:** Unit was field reviewed. No soil, wetland, or karst concerns.

**Mitigation:** None



### **Wildlife/TES Plants**

**Concern:** A ¼ mile eagle nest timing buffer may be located within the helicopter flight path.

**Mitigation:** Avoid repeated helicopter flights within ¼ mile of nest from March 1 through May 31. Surveys needed to determine nest activity prior to implementation, if nest is active, continue to avoid repeated helicopter flights through August 31.

---

### **Visual/Recreation**

**Concern:** Meet Visual Quality Objectives of partial retention for portion of the unit (easternmost 1/3) seen from saltwater.

**Mitigation:** Retaining 70% of the timber along with these mitigation measures will allow the unit to meet a Visual Quality Objective of partial retention. Individual selection and/or 2-acre horizontal group cuts that follow the contours where possible. Make sure boundaries of group cuts are uneven in size and shape so that they appear to be natural openings in the forest canopy. Leave non-merchantable trees.

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### **Other Resources/Issues**

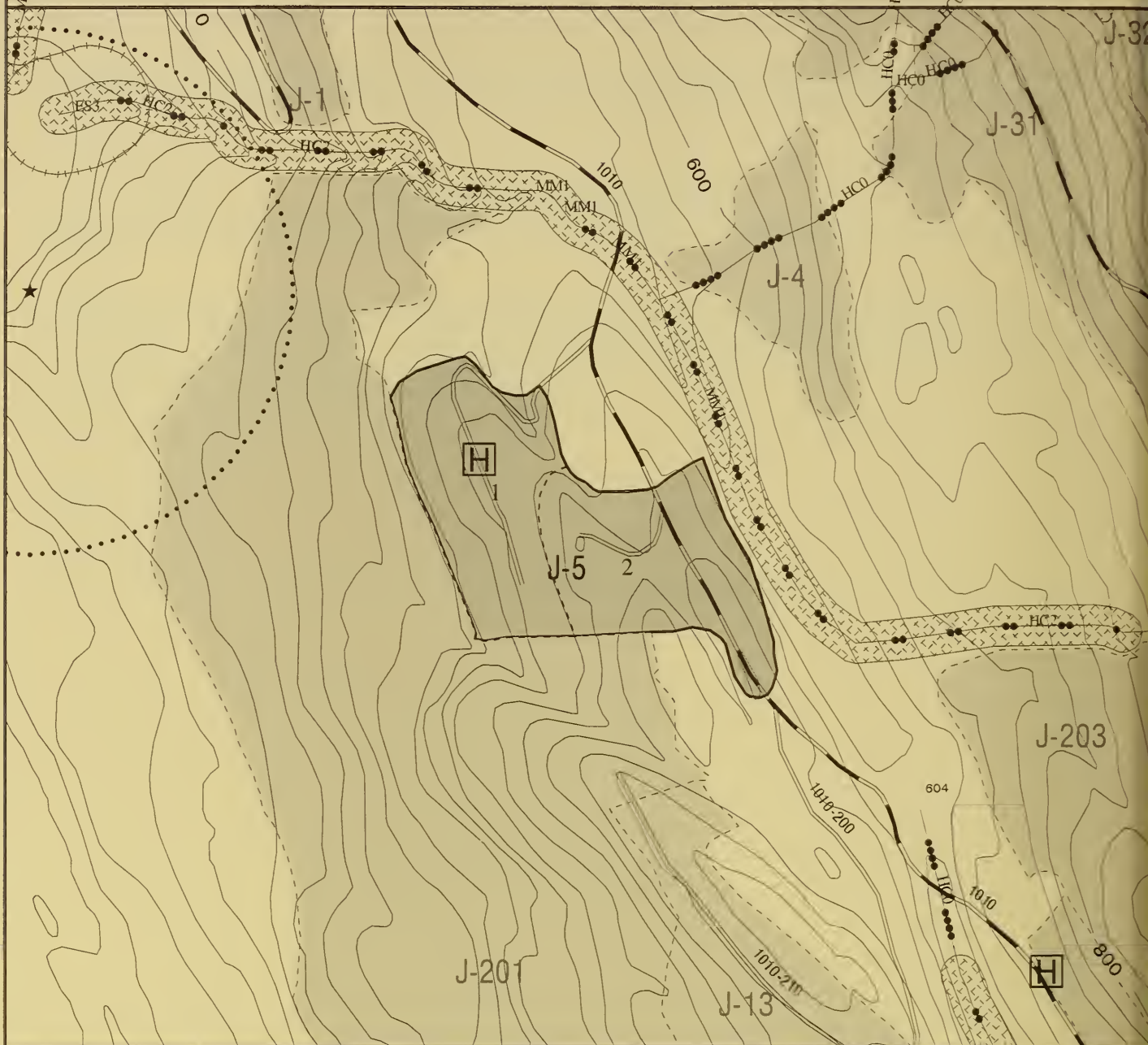
**Concern:** None

**Mitigation:** None

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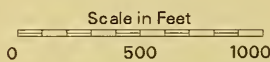
# UNIT J-5

37 ACRES



- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- Proposed LTF Sites
- HC1, MM3, ...* Channel Types

Scale: 1" = 800 ft



Potential Helicopter Landings

Other Landings

Very High Hazard Soils (MMI4)  
300' Offset From Class 1 Streams

Second Growth

Sort Yards

Eagle Nest Tree

Proposed cut units

Adjacent proposed units

TTRA Buffers

1/4 Mile Eagle Nest Timing Buffers

Setting

State/Private Land

Lakes



Harvest Method: Running SkylineTotal Acres: 37 Total Volume: 677 MBFVolume per Acre 18 MBF**UNIT DEVELOPMENT**

Unit designed to meet Visual Quality Objective of partial retention. Unit boundaries modified in the field due to unsuitable timber. Modified northeastern arm due to unsuitable timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, T1, W1, W7, W31, V1, V7, and V13. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder using a running skyline system on two settings. The roads will be used as continuous road-side landings. A profile in the west setting indicates poor deflection. Deflection and tailholds are poor on that flat central ridgetop, but because the timber is small and defective, no logging problems are anticipated. Tailholds are poor and multiple-stump anchors will be necessary. A class II stream and tributary have 100' buffers making the east boundary (BMP 12.6(a), 13.16). The NE arm of the unit was deleted due to poor timber. The north, south, and SE boundaries were modified to exclude unsuitable timber. The unit contains scattered patches of merchantable timber. No blowdown problems are expected. The unit has visual concerns from the west, and as a result, in this unit 20-30% of the merchantable timber in the seen portion of the unit will remain to reduce the visual effects of harvest and meet Visual Quality Objectives.

**Specified Roads:** The unit is accessed by the 1010 road.

**Temporary Roads:** Two temporary roads are needed. The NW road is approx. 2300' long with potential rock quarry, the SE road is approx. 800' long and ends at a large landing.

**Stand Management Objectives:** Future stand will have two or more canopy layers. All of the non-merchantable trees and approximately 20 to 25% of all the merchantable trees will be retained over most of the unit to meet visual objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 609 MBF). Leave at least 10-15% retention overall, and concentrate reserve trees in the seen areas, so that the seen portion maintains 20-25% of the merchantable and all non-merchantable trees. Reserve trees should be scattered throughout the seen area; in not seen areas, they can be clumped within 50-100 feet of the unit/setting boundaries. Leave trees may be lower quality merchantable trees with high defect, but should be free of defect. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

#### **RESOURCE CONCERNS & MITIGATION**

##### **Watershed/Fisheries**

**Concern:** East unit boundary borders Class II Jenkins Creek (MM1).

**Mitigation:** Unit provides 120-foot (TTRA) buffer adjacent to Jenkins Creek (BMPs 12.6, 12.6a).

##### **Soils/Wetlands/Karst**

**Concern:** None

**Mitigation:** None

##### **Wildlife/TES Plants**

**Concern:** None

**Mitigation:** None

##### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in areas seen from saltwater (primarily the western third of the unit and along the southern boundary, except for the eastern portion).

**Mitigation:** By leaving non-merchantable and 20-25% of merchantable trees in the seen portions of the unit, and by implementing mitigation measures, the unit will meet a Visual Quality Objective of partial retention. Vary edges of unit and do not use straight edges to give the unit a more natural shape. Unit needs a review by a landscape architect during final layout to make sure that layout will achieve the VQO of partial retention.

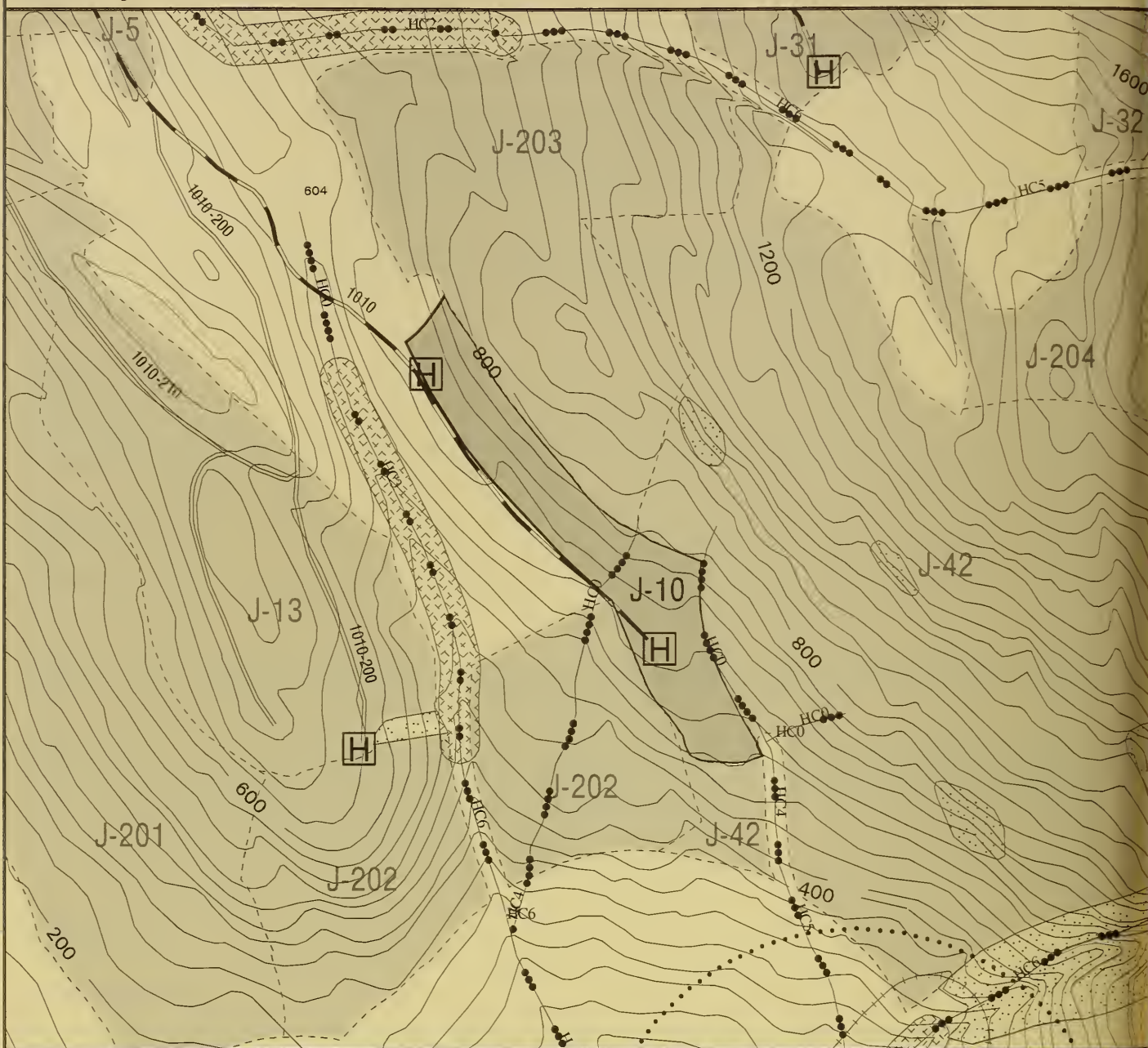
##### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

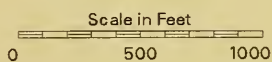
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|---------------|----------------------|--|----------------------------------|--|------------------------------------|
|               | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|               | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|               | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|               | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|               | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|               | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|               | 40' Contours         |  |                                  |  | State/Private Land                 |
| <b>E</b>      | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| HC1, MM3, ... | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



Harvest Method: Running Skyline

Total Acres: 21 Total Volume: 613 MBF

Volume per Acre 29 MBF

#### UNIT DEVELOPMENT

Unit is designed to meet Visual Quality Objective of partial retention. A Class IV stream cuts through the southeastern portion and can be yarded across. Therefore, the lower portion of Unit J-42 (helicopter), which was originally part of J-10, could be added back to J-10 and cable-yarded. This unit may include helicopter landings for Unit J-42. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

##### Logging and Transportation:

The timber can be yarded using a small mobile yarder using a running skyline system configuration (grapples are recommended). The 1010 road will be used as a continuous road-side landing. The landings may be used to helicopter logs from Unit J-42. Deflection is good. Tailholds are poor in some areas and multiple-stump anchors may be necessary. The southern boundary was modified for logging feasibility. A portion of the original unit east of the Class IV stream on the southeastern boundary, was deleted and added to J-42 which is helicopter. This area could be added back to J-10 and cable-yarded. The timber is average with one patch of marginal timber. The unit has visual concerns from the south and west; see Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 10 road and the 1010 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 551 MBF). Leave scattered and clumped leave trees, snags, and non-merchantable trees within 50-100 feet of the unit/setting boundaries. Leave a higher percentage of reserve trees on visible boundaries (particularly the southern 1/2 of the unit) and a lower percentage in the unseen northern 1/2 of the unit. Due to visual concerns special methods are needed. See Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

### **RESOURCE CONCERNS & MITIGATION**

#### **Watershed/Fisheries**

**Concern:** Unit contains Class IV (HC0) stream flowing into Madan Bay. East unit boundary borders Class IV (HC0) stream flowing into un-named Class I stream entering Madan Bay. Verification Update: Stream locations and classifications verified after initial unit reconnaissance.

**Mitigation:** Provide full suspension or split yard, wherever possible, across Class IV streams; at least partial suspension is required (BMP 13.9, 13.16).

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#### **Soils/Wetlands/Karst**

**Concern:** None

**Mitigation:** None

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#### **Wildlife/TES Plants**

**Concern:** Almost entire unit is high deer HSI values. Less than 1 acre of high probability goshawk nesting habitat occurs along the southern boundary.

**Mitigation:** Leave reserve and non-merchantable trees.

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#### **Visual/Recreation**

**Concern:** Meet visual quality objective of partial retention in areas seen from saltwater (southeastern 1/2).

**Mitigation:** Concentrate reserve trees in southern 1/2 of unit. Vary edges and backline of unit (primarily edges in the southern 1/2 of unit) to give unit a more natural shape. Feather edges in southern 1/2 of unit. Do not use any straight edges in the southern 1/2 of unit.

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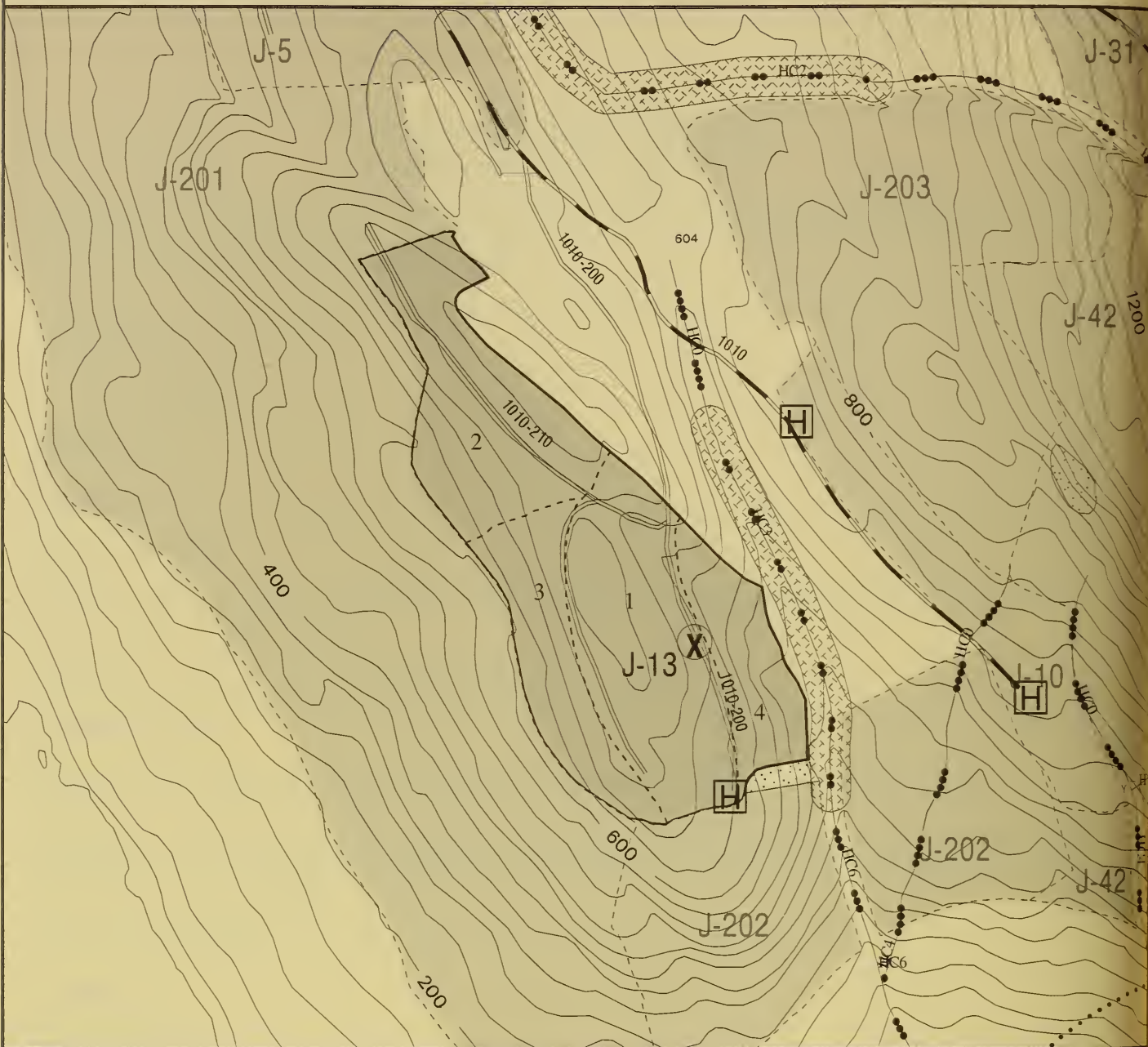
#### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None



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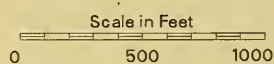


- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- E** Proposed LTF Sites
- HC1, MM3, ... Channel Types

- Potential Helicopter Landings
- Other Landings
- Very High Hazard Soils (MM14)
- 300' Offset From Class 1 Streams
- Second Growth
- Sort Yards

- Eagle Nest Tree
- Proposed cut units
- Adjacent proposed units
- TTRA Buffers
- 1/4 Mile Eagle Nest Timing Buffers
- Setting
- State/Private Land
- Lakes

Scale: 1" = 800 ft



Harvest Method: Running Skyline, Shovel, Live Skyline

Total Acres: 63 Total Volume: 1,762 MBF

Volume per Acre: 28 MBF

### UNIT DEVELOPMENT

Unit designed to meet Visual Quality Objective of partial retention. Western portion (below ridge top) needs to be screened to ensure that there is no "skyline" effect. Unit accessed by specified road 1010-200 and 1010-210 as well as temporary road J-13.1 (1,600'). Planned logging systems include shovel logging on the ridge top and cable logging on the west and east slopes. This unit may include alternate helicopter landings for Unit J-42. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F15, T1, W1, W7, V1, V7, and V8. These measures are described below within the resource sections that apply.

#### Logging and Transportation:

The unit has four settings. The timber can be yarded using a small mobile yarder in a running skyline configuration on two settings, a shovel on one setting, and a 70' tower in a live skyline configuration on one setting. The temporary spur and the 10210 road will both be used as continuous roadside landings. Landings in this unit may be used as alternatives for helicopter logging J-42. Three profiles indicate that deflection is adequate if hanging across the eastern Class II stream and that rigging tailtrees may be needed for additional lift. The east boundary was placed on the slope break of the Class II stream (BMP 12.6(a), 13.16). On west boundary, tailholds are poor and multiple-stump anchors will be necessary. The unit has visual concerns from the west; leave 20-30% of all trees including reserve trees and non-merchantable residual trees on the west seen area in the unit, to screen harvest and roads in unit. Leave more trees downhill side of roads to screen roads.

**Specified Roads:** The unit is accessed by the 10200 road and the 10210 road.

**Temporary Roads:** A 1,200-ft. long temporary road is needed for the SW settings of the unit.

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives. The future stand in the western portion of the unit will have two or more canopy layers. All of the non-merchantable trees and approximately 20 to 25% of all the merchantable trees will be retained over most of the unit to meet visual objectives.

#### Silvicultural Prescription:

Clearcut with Reserve Trees (estimated harvest volume = 1,586 MBF). Leave at least 10-15% retention overall, and concentrate reserve trees in the seen areas, so that the seen portion maintains 20-25% of the merchantable and all non-merchantable trees. Reserve trees should be scattered throughout the seen area; in not-seen areas, they can be clumped within 50-100 feet of the unit/setting boundaries. Also, leave scattered trees along with snags and non-merchantable trees in areas with steep slopes (southern portion) and within 50 - 100 feet of the unit/setting edge boundaries, especially along western side of ridgeline. Due to visual concerns special methods are needed. See Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.



**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

### **RESOURCE CONCERNS & MITIGATION**

#### **Watershed/Fisheries**

**Concern:** East unit boundary borders Class II (HC3) stream flowing into Madan Bay. Tailholds may be required across stream. Verification Updates: Isolated cutthroat trout population verified adjacent to harvest unit, after initial unit reconnaissance.

**Mitigation:** No harvest within 100 feet of stream (non-TTRA), or on sideslope adjacent to stream, whichever is further (BMPs 12.6, 12.6a). Fisheries personnel will assist with final layout.

#### **Soils/Wetlands/Karst**

**Concern:** One area of steep slopes (110%) for a short slope length (100 ft) in southeastern portion of the unit.

**Mitigation:** Boundary modified to exclude southeast corner of unit.

#### **Wildlife/TES Plants**

**Concern:** High deer HSI value in lower elevations of the western and middle portions of the unit.

**Mitigation:** Leave non-merchantable and some merchantable trees in western portion of unit to provide some snow interception.

#### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in portions of unit visible from saltwater (area of unit west of ridge).

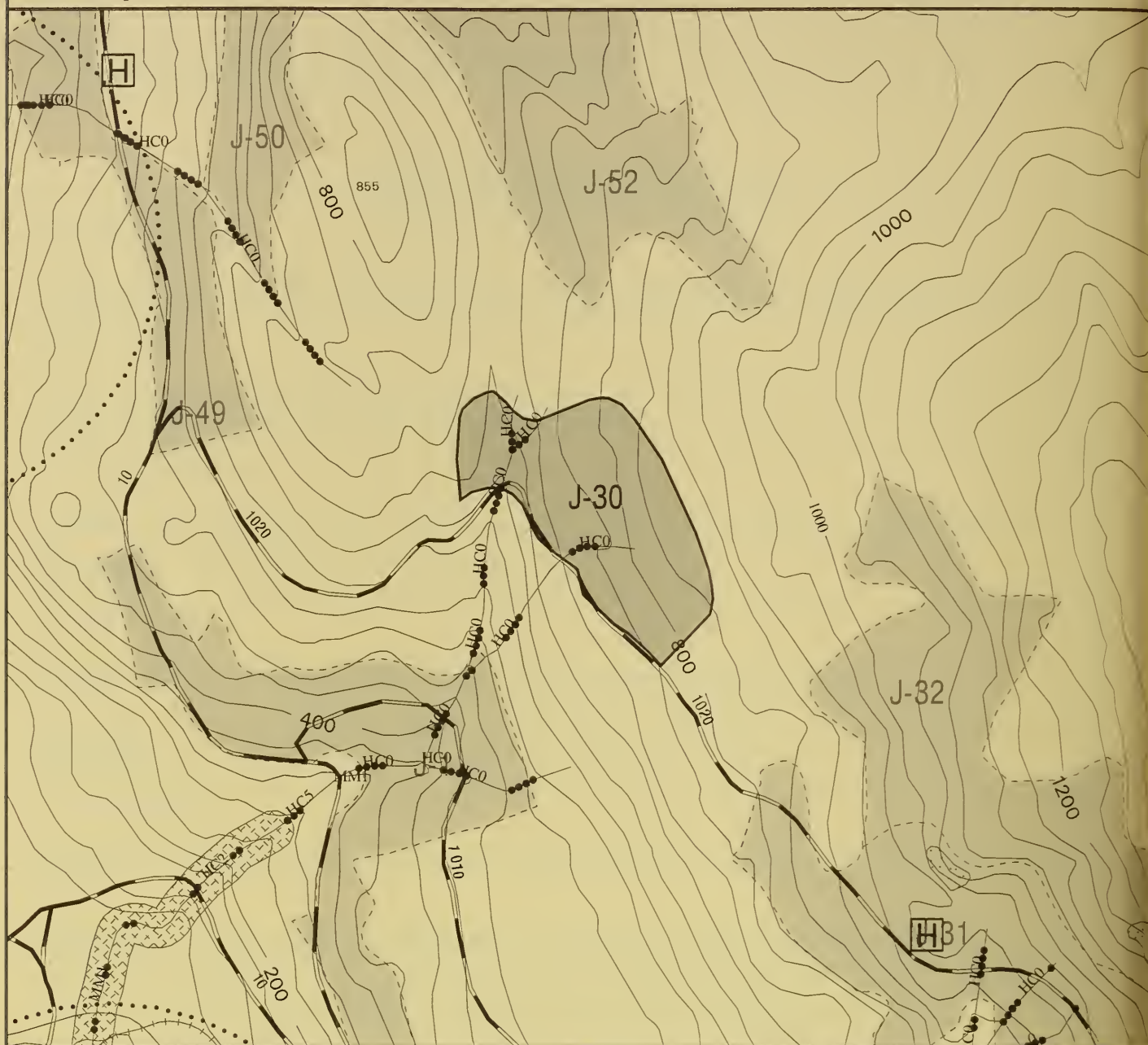
**Mitigation:** Leave 20-25% of all trees including non-merchantable and some merchantable trees in western portion of the unit that is visible from saltwater. Concentrate trees to be left below roads in seen areas so that roads and harvest are screened from saltwater. Vary edges and backline of unit to make unit to give unit a more natural shape. Unit needs a review by a landscape architect during final layout to make sure that layout will achieve the VQO of partial retention.

#### **Other Resources/Issues**

**Concern:** None

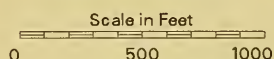
**Mitigation:** None

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|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft





**MADAN TIMBER SALE - UNIT CARD** Unit Number J-30 Selected Alternative  
Harvest Method: Running Skyline  
Total Acres: 21 Total Volume: 265 MBF Volume per Acre: 12 MBF

### UNIT DEVELOPMENT

Boundaries modified due to unsuitable timber on the south end. Unit boundary brought to the road on the western side. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F11, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

#### Logging and Transportation:

The timber can be yarded using a small mobile yarder in a running skyline configuration using the road as continuous road-side landing. Deflection is adequate. 10' tailtrees may help logging in the south portion. Tailholds are adequate. The road is the western boundary. The southern boundary was modified to exclude unsuitable timber. Three Class IV streams in center of unit can be partially suspended or split-yarded and require directional felling (BMP 12.6(a), 13.16). The timber is poor to fair quality. The unit has slight visual concerns from the west; leave reserve trees concentrated in the easternmost (and highest in elevation) portion of the unit.

**Specified Roads:** The unit is accessed by the 1020 road and a potential rock quarry is in the NW unit.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimate harvest volume = 239 MBF). Leave scattered and clumped trees, snags, and non-merchantable trees within 50-100 feet of the unit/setting boundaries. Leave a higher percentage of reserve trees on the upper portion (eastern half of unit) to meet the partial retention Visual Quality Objective. Due to visual concerns, special methods are required; see Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

### **RESOURCE CONCERNS & MITIGATION**

#### **Watershed/Fisheries**

**Concern:** Unit contains Class IV (HC0) tributary of un-named (non-TTRA) Class II stream flowing into north side of Jenkins Cove.

**Mitigation:** Provide full suspension or split yard, wherever possible, across Class IV streams; at least partial suspension is required (BMP 13.9, 13.16).

#### **Soils/Wetlands/Karst**

**Concern:** Approximately 0.3 acre of poorly drained soils/muck with very small to small inclusions of Maybeso soils in the northeast portion of unit. Other organic soils also present, however, they contained a mineral component.

**Mitigation:** If possible, avoid shovel logging within unit.

#### **Wildlife/TES Plants**

**Concern:** None

**Mitigation:** None

#### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in areas visible from saltwater (approximately eastern [uphill] 1/3 of unit).

**Mitigation:** With Alternatives 2 and 5, leave scattered leave trees, snags, and non-merchantable trees within 50-100 feet of the unit/setting boundaries. Leave a higher percentage of reserve trees in the eastern or upper 1/3 of unit to reduce visibility of harvest.

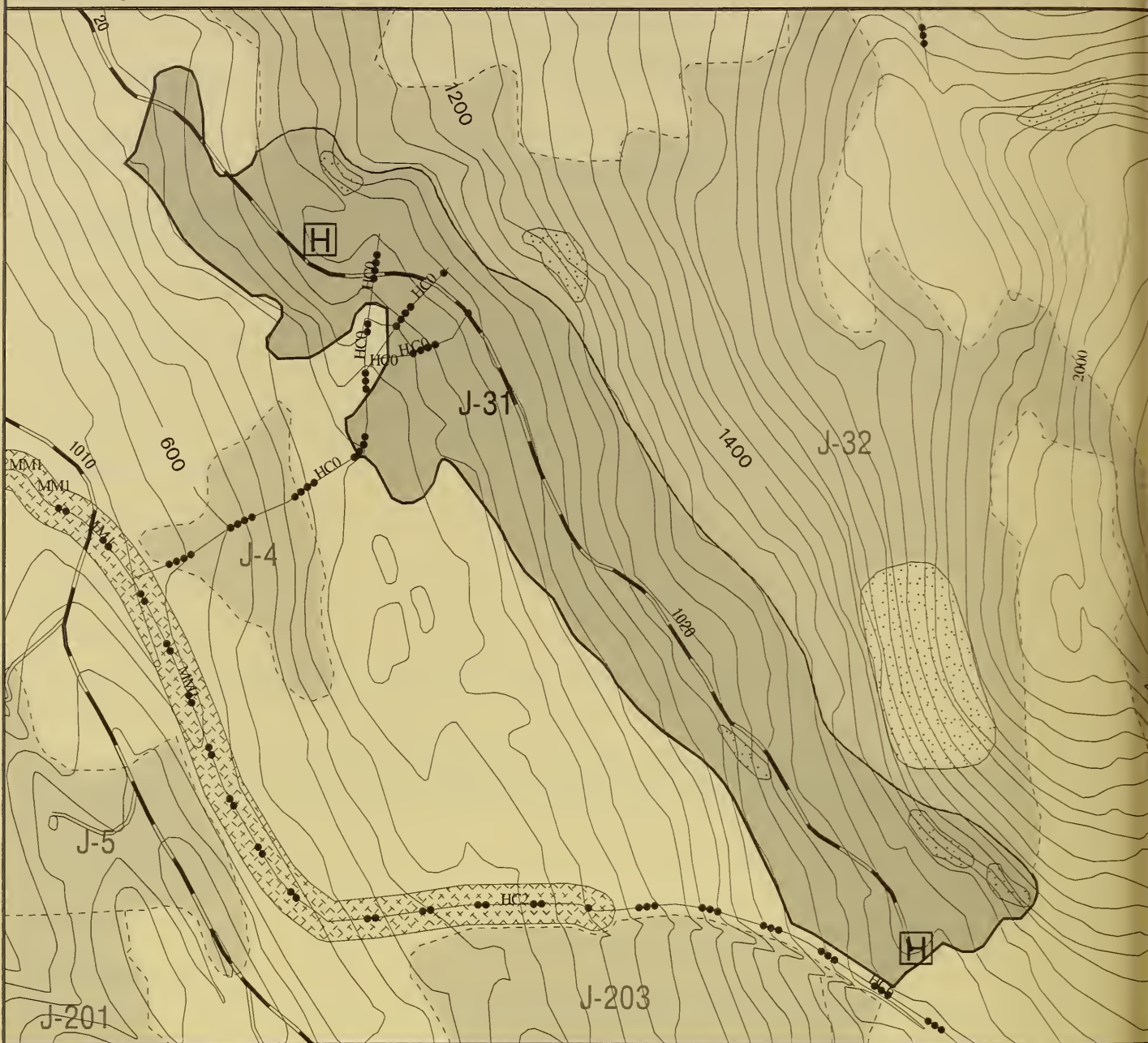
#### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

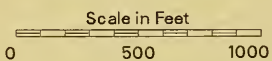
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|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | TTRA Buffers                     |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 3 Streams      |  | 300' Offset From Class 1 Streams |  | Setting                            |
|  | Class 4 Streams      |  | Second Growth                    |  | State/Private Land                 |
|  | 40' Contours         |  | Sort Yards                       |  | Lakes                              |
|  | Proposed LTF Sites   |  |                                  |  |                                    |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



**MADAN TIMBER SALE - UNIT CARD** Unit Number J-31 Selected AlternativeHarvest Method: Running SkylineTotal Acres: 111 Total Volume: 941 MBFVolume per Acre: 9 MBF**UNIT DEVELOPMENT**

Unit designed to meet Visual Quality Objective of partial retention and to minimize impacts to wet area. This unit will include helicopter landings for Unit J-32, J-37, J42, and J-204. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F11, F15, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration using the road as a continuous road-side landing. Landings may be used for helicopter logging J-32. A Class III stream is located on the SE boundary. Several other Class III/IV streams can be partially suspended or split-yarded and require directional felling (BMP 12.6(a), 13.16). The timber is not consistent in quality. The unit has visual concerns from the west; cut only patches of high quality timber. See Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 1020 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 235 MBF). Harvest individual trees and/or groups up to 2 acres scattered throughout the unit. Leave a higher percentage of reserve trees on visible boundaries and a lower percentage on non-seen edges. Avoid harvesting altogether on three small areas with slopes greater than 72%. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

## RESOURCE CONCERNS & MITIGATION

### **Watershed/Fisheries**

**Concern:** Unit contains Class IV (HC0) tributary of Jenkins Creek. Southern unit boundary borders Class III (HC6) section of Jenkins Creek.

**Mitigation:** No harvest on sideslope adjacent to Jenkins Creek (BMP 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMP 13.9, 13.16).

### **Soils/Wetlands/Karst**

**Concern:** There are 3 small areas with steep slopes (greater than 72%). Approximately 15-20 acres of sandy muck soil, small wetlands, and drainages in central portion of unit (see field data map).

**Mitigation:** Locate harvest patches to avoid steep slopes. Avoid shovel logging within wet area.

### **Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal problems for some small mammals.

**Mitigation:** Scatter reserve trees to maintain structure throughout unit to allow dispersal.

### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in areas visible from saltwater, which is virtually all of the unit. From saltwater, the group selections will be small and barely noticeable, but should still have natural (uneven) shapes and should appear to be natural openings. Seeing the road in Alternative 2 is more of a concern than the harvest unit.

**Mitigation:** Group selection will consist of approximately 2-acre horizontal patch cuts that follow the contours. Approximately 10% of basal area is to be retained as reserve trees. Make sure the patch cuts are uneven in shape and randomly spaced within Unit J-31 to create a natural pattern of small openings. Leave as many small trees and unmerchantable trees as possible in the patch cuts below the road to screen the road from saltwater.

### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

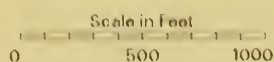


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|-----------------------------|----------------------------------|------------------------------------|
| Proposed Spec. Roads        | Potential Helicopter Landings    | Eagle Nest Tree                    |
| Proposed Temp. Roads        | Other Landings                   | Proposed cut units                 |
| Class 1 Streams             | Very High Hazard Soils (MMI4)    | Adjacent proposed units            |
| Class 2 Streams             | 300' Offset From Class 1 Streams | TTRA Buffers                       |
| Class 3 Streams             | Second Growth                    | 1/4 Mile Eagle Nest Timing Buffers |
| Class 4 Streams             | Sort Yards                       | Setting                            |
| 40' Contours                |                                  | State/Private Land                 |
| Proposed LTF Sites          |                                  | Lakes                              |
| HC1, MM3, ... Channel Types |                                  |                                    |

Scale: 1" = 800 ft



**MADAN TIMBER SALE - UNIT CARD** Unit Number J-32 Selected Alternative  
Harvest Method: Helicopter  
Total Acres: 217 Total Volume: 7,382 MBF Volume per Acre: 34 MBF

#### UNIT DEVELOPMENT

Unit designed to meet Visual Quality Objective of partial retention. Areas with MMI4 soil were removed from Unit. A wet area with organic soils occurs along the southern boundary. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, F15, F18, T1, W6, and V6. These measures are described below within the resource sections that apply.

##### **Logging and Transportation:**

The timber can be yarded using a helicopter to landings in J-31. Avoid the wet area near the Class III stream on the southeastern boundary (12.6(a), 13.16). Locate harvest patches to avoid MMI4 soils (BMP 13.5). The unit has visual concerns from the west and south; see visuals.

**Specified Roads:** The timber will be flown to the 1020 road.

**Temporary Roads:** None

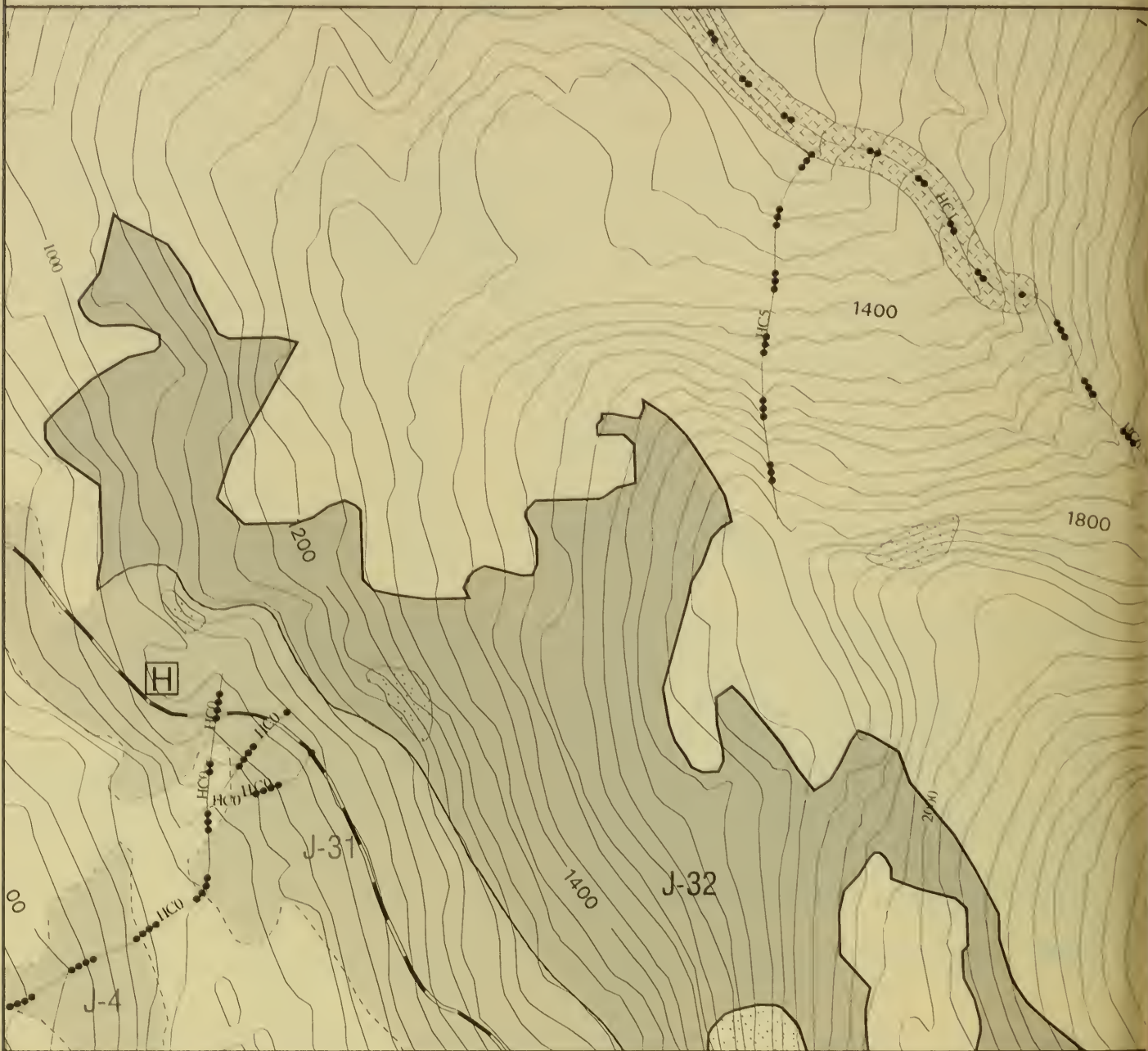
**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 1,846 MBF). Harvest individual trees and/or groups up to 2-horizontal acres scattered throughout the unit. Avoid harvest on MMI4 soils (see Soils/Wetlands/Karst section). This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees compared with clearcutting. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

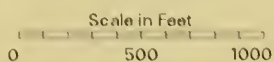
**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.





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|----------------------|----------------------------------|------------------------------------|
| Proposed Spec. Roads | Potential Helicopter Landings    | Eagle Nest Tree                    |
| Proposed Temp. Roads | Other Landings                   | Proposed cut units                 |
| Class 1 Streams      | Very High Hazard Soils (MMI4)    | Adjacent proposed units            |
| Class 2 Streams      | 300' Offset From Class 1 Streams | TTRA Buffers                       |
| Class 3 Streams      | Second Growth                    | 1/4 Mile Eagle Nest Timing Buffers |
| Class 4 Streams      | Sort Yards                       | Setting                            |
| 40' Contours         |                                  | State/Private Land                 |
| Proposed LTF Sites   |                                  | Lakes                              |
| Channel Types        |                                  |                                    |

Scale: 1" = 600 ft



## **RESOURCE CONCERNS & MITIGATION**

### **Watershed/Fisheries**

**Concern:** Southernmost unit boundary borders Class III (HC5 and HC6) Jenkins Creek. Unit may contain un-mapped Class IV headwaters of Jenkins Creek. MMI4 soils present within unit.

**Mitigation:** No harvest on sideslope adjacent to Jenkins Creek (BMP 12.6, 12.6a). Helicopter yarding is expected to provide full suspension across Class IV streams, at least partial suspension is required (BMP 13.9, 13.16).

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### **Soils/Wetlands/Karst**

**Concern:** There are two areas of MMI4 soils (see field data map). Approximately 11-15 acres of wet areas (in 2 separate areas) in the south end of unit (unit lobe farthest East). The largest wet area occurs along the creek on the southern boundary of the unit (muskeg associated plants and mucky soils with a mineral component occur within this area).

**Mitigation:** Locate harvest patches to avoid MMI4 areas. The 2 known MMI4 soils areas have been removed from the unit. Avoid shovel logging within wet areas. Partial suspension needed in steeper areas.

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### **Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal problems.

**Mitigation:** Scatter reserve trees to maintain structure throughout unit to allow dispersal.

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### **Visual/Recreation**

**Concern:** Meet visual quality objective of partial retention (virtually all of unit is seen from saltwater). From saltwater, the group selections will have natural (uneven) shapes and should appear to be natural openings.

**Mitigation:** Lay the 2-acre group cuts out horizontally along contours to minimize visual impacts. Make sure the group cuts are uneven in shape and randomly spaced within Unit 32 to create a natural pattern of small openings. Leave non-merchantable trees.

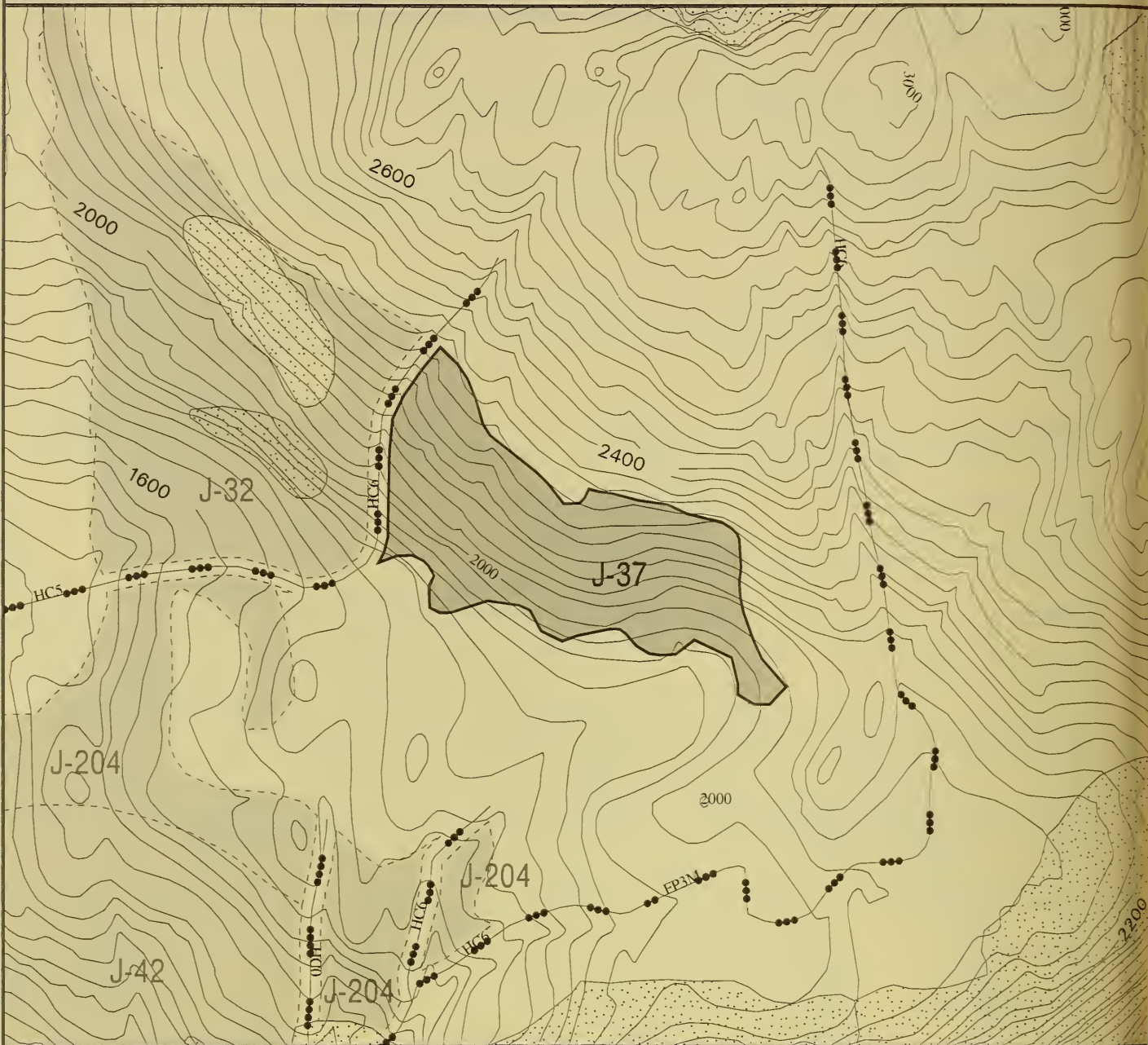
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### **Other Resources/Issues**

**Concern:** None

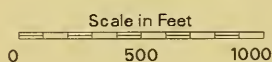
**Mitigation:** None





- |  |                      |  |                                  |  |                                    |
|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft





**MADAN TIMBER SALE - UNIT CARD**      Unit Number J-37      Selected Alternative

Harvest Method: Helicopter

Total Acres: 34      Total Volume: 1,142 MBF

Volume per Acre: 34 MBF

**UNIT DEVELOPMENT**

Unit has not been field verified. Additional field verification is required. Boundaries correspond with mapped suitability timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F18, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:** This unit design has not been field verified. This unit is best suited for helicopter yarding because an access road would be economically prohibitive. The timber can be helicopter yarded to the 1010 road in J-10 (Alt. 3 yarding distance = 1.0 miles), or yarded to a barge in Madan Bay (Alt. 4 yarding distance = 1.5 miles). A non-fish stream on the west boundary (possible "V" notch) will likely need protection such as a buffer or directional felling. The remaining boundaries are intended to be at the limit of merchantable timber. The middle 1/3 of the unit can be seen from saltwater.

**Specified Roads:** The timber can be helicopter yarded to the 1010 road in unit J-10 for Alt. 3, or a barge in Madan Bay for Alt. 4.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 286 MBF). Harvest individual trees and/or groups up to 2-horizontal acres that follow the contours and are scattered throughout the unit. Leave a higher percentage of reserve trees on visible boundaries and a lower percentage on non-seen edges. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees compared with clearcutting. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION**

**Watershed/Fisheries**

**Concern:** West unit boundary borders Class III (HC6) Jenkins Creek. Unit may contain un-mapped Class IV tributaries of Jenkins Creek or un-named stream flowing into Madan Bay.

**Mitigation:** No harvest on sideslope adjacent to Jenkins Creek (BMP 12.6, 12.6a). Helicopter yarding is expected to provide full suspension across Class IV streams, at least partial suspension is required (BMP 13.9, 13.16).

**Soils/Wetlands/Karst**

**Concern:** Based on soil mapping and aerial photo interpretation, there are no apparent soil concerns. However, field review during final layout may identify areas of instability.

**Mitigation:** Helicopter yarding with full suspension, partial harvest retaining 70% of the stand, and selectively placing harvest patches, will protect soil resources.

**Wildlife/TES Plants**

**Concern:** None

**Mitigation:** None

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**Visual/Recreation**

**Concern:** Meet Visual Quality Objectives of partial retention for portion of the unit (middle 1/3) seen from saltwater.

**Mitigation:** Individual selection and/or 2-acre group cuts that follow the contours. Make sure boundaries of group cuts are uneven in size and shape so that they appear to be natural openings in the forest canopy. Leave non-merchantable trees.

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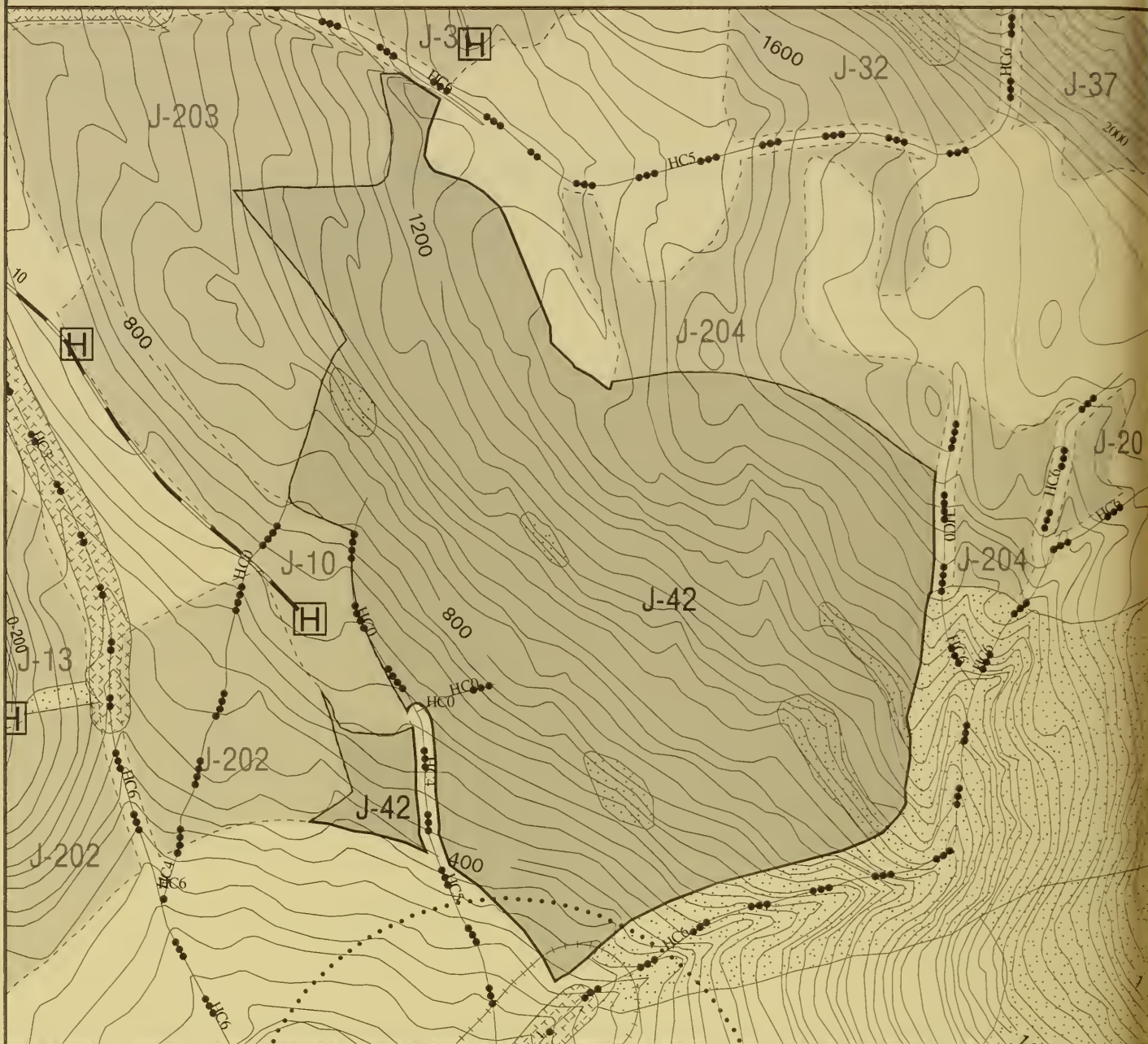
**Other Resources/Issues**

**Concern:** None

**Mitigation:** None

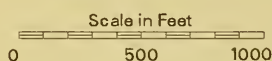
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|----------------------|----------------------------------|------------------------------------|
| Proposed Spec. Roads | Potential Helicopter Landings    | Eagle Nest Tree                    |
| Proposed Temp. Roads | Other Landings                   | Proposed cut units                 |
| Class 1 Streams      | Very High Hazard Soils (MM14)    | Adjacent proposed units            |
| Class 2 Streams      | 300' Offset From Class 1 Streams | TTRA Buffers                       |
| Class 3 Streams      | Second Growth                    | 1/4 Mile Eagle Nest Timing Buffers |
| Class 4 Streams      | Sort Yards                       | Setting                            |
| 40' Contours         |                                  | State/Private Land                 |
| Proposed LTF Sites   |                                  | Lakes                              |
| Channel Types        |                                  |                                    |

Scale: 1" = 800 ft



Harvest Method: HelicopterTotal Acres: 192 Total Volume: 8,686 MBFVolume per Acre: 45 MBF**UNIT DEVELOPMENT**

Unit designed to meet the Visual Quality Objective of partial retention. The southern portion of Unit J-10 was added to this unit due to logging constraints in J-10. Contour patches will minimize visual concerns. Timber would be carried to landings in either Units J-10 or J-13. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F15, F18, T1, W6, W8, W13, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a helicopter to landings in J-10 (or J-13). The south west boundary was adjusted to include timber not able to be cable logged in unit J-10. The southeast boundary is a Class III stream which needs a slope break buffer and directional felling. Several Class IV streams require directional felling (BMP 12.6(a), 13.16). The unit has visual concerns from the west and south. See Visual/recreation section.

**Specified Roads:** The timber will be flown to the 1010 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 2,171 MBF). Harvest individual trees and/or groups up to 2 acres scattered throughout the unit. Locate harvest patches on slopes <72%. Leave a higher percentage of reserve trees on visible boundaries and a lower percentage on non-seen edges. This prescription would address visual, soils, and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees compared with clearcutting. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Northernmost unit boundary borders Class III (HC6) Jenkins Creek. Southern unit boundary borders Class III tributaries to un-named Class I stream flowing into Madan Bay. Unit may contain un-mapped Class IV headwater streams. Past windthrow observed in unit and debris flow/torrent observed in Class III channel.

**Mitigation:** No harvest on sideslope adjacent to Jenkins Creek or other Class III streams. Harvest prescription (70% retention) will maintain windfirm buffers (BMP 12.6, 12.6a). Helicopter yarding is expected to provide full suspension across Class IV streams, at least partial suspension is required (BMP 13.9, 13.16).

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#### **Soils/Wetlands/Karst**

**Concern:** Steep slopes (greater than 72%) occur within the unit.

**Mitigation:** Locate harvest patches on slopes less than 72%. At least partial suspension in other steeper areas.

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#### **Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal problems. A small portion of a ¼ mile eagle nest timing buffer is located in the southern most portion of the unit.

**Mitigation:** Scatter reserve trees to maintain structure throughout unit to allow dispersal. Avoid repeated helicopter flights within ¼ mile of nest from March 1 through May 31. Surveys needed to determine nest activity prior to implementation, if nest is active, continue to avoid repeated helicopter flights through August 31.

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#### **Visual/Recreation**

**Concern:** Meet visual quality objective of partial retention (virtually all of unit is seen from saltwater). From saltwater, the group selections will have natural (uneven) shapes and should appear to be natural openings.

**Mitigation:** 2-acre group cuts will run horizontally with contour lines to minimize visual impacts. Make sure the group cuts are uneven in shape and randomly spaced to create a natural pattern of small openings. Leave non-merchantable trees.

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#### **Other Resources/Issues**

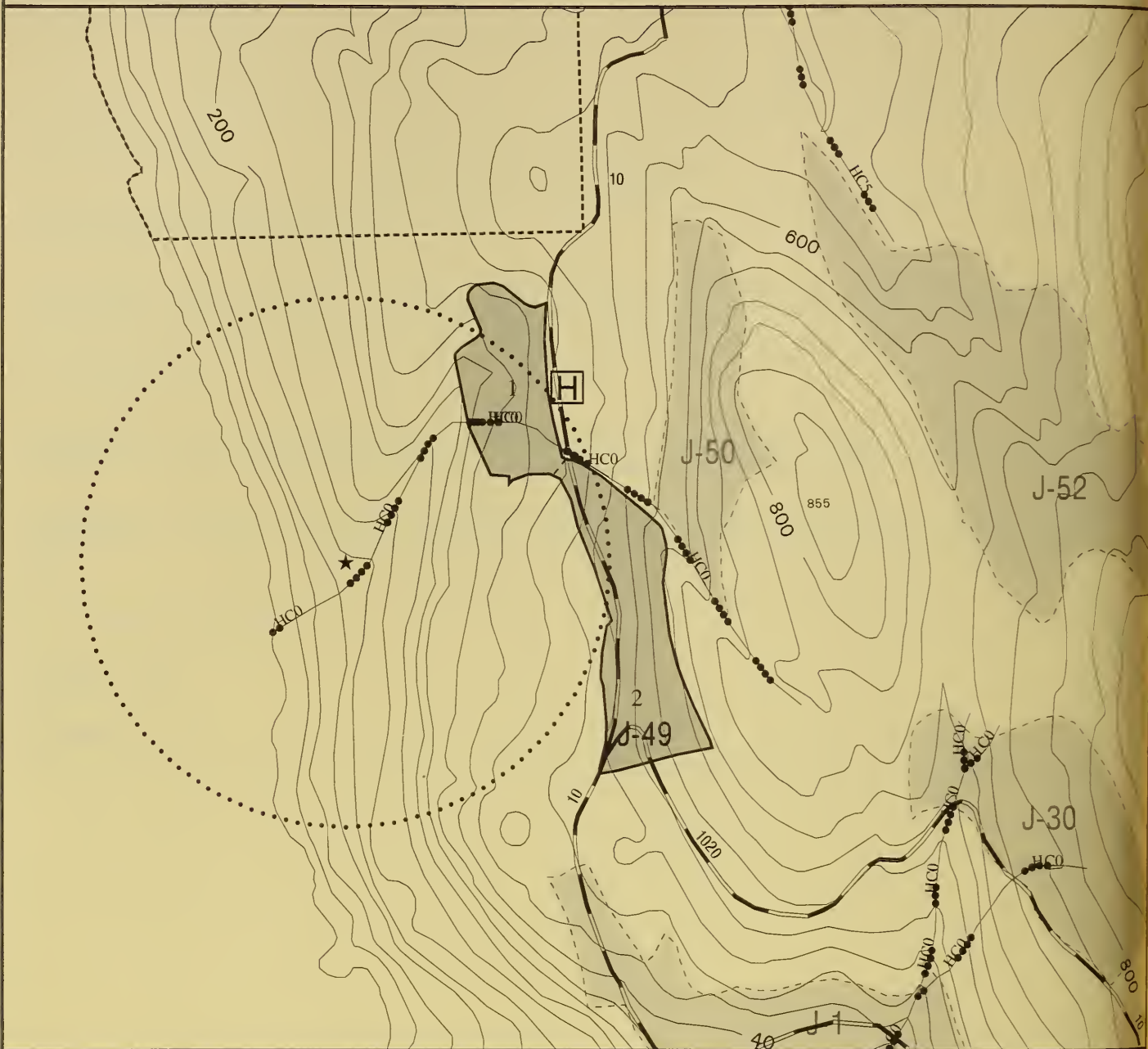
**Concern:** None

**Mitigation:** None

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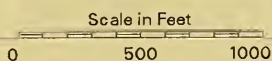


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|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  |                                  |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  | Sort Yards                       |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



**MADAN TIMBER SALE - UNIT CARD** Unit Number J-49 Selected Alternative

Harvest Method: Running skyline

Total Acres: 21

Total Volume: 398 MBF

Volume per Acre: 19 MBF

**UNIT DEVELOPMENT**

Unit designed to meet Visual Quality Objective of partial retention. Northwestern boundary was modified in the field to remove muskeg and unsuitable timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F11, T1, W1, W7, W13, V1, V7, and V13. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration on both settings using the roads as continuous road-side landings. Portions of the unit can be shovel yarded. Deflection is adequate. Tailholds are poor on the NW boundary and multiple-stump anchors will be necessary. The NW boundary was modified to leave out unsuitable timber. The western boundary was measured and exceeds the 1000' ocean buffer requirement. A Class IV stream in center of unit can be split-yarded and requires directional felling (BMP 12.6(a), 13.16). The timber in the southern setting is low value muskeg type timber; the northern setting has better quality timber. There is little existing windthrow in the unit and blowdown after harvest is not expected to be a problem. Due to visual concerns from the west special methods are needed; see Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 10 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will have two or more canopy layers. All of the non-merchantable trees and approximately 20 to 25% of all the merchantable trees will be retained over most of the unit to meet visual objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 357 MBF). Leave at least 10-15% retention overall, and concentrate reserve trees in the seen areas, so that the seen portion maintains 20-25% of the merchantable and all non-merchantable trees. Reserve trees should be scattered throughout the seen area; in not-seen areas, they can be clumped within 50-100 feet of the unit/setting boundaries. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

**RESOURCE CONCERNS & MITIGATION**

**Watershed/Fisheries**

**Concern:** Unit contains Class IV (HC0) stream flowing directly into Eastern Passage. Verification Updates: Stream locations and classifications verified after initial unit reconnaissance.

**Mitigation:** Provide full suspension or split yard, wherever possible, across Class IV streams; at least partial suspension is required (BMP 13.9, 13.16).



### **Soils/Wetlands/Karst**

**Concern:** Northwest portion of unit includes low value muskeg. Southwest portion has small forested muskeg with very open canopy of yellow-cedar.

**Mitigation:** Boundary along northwest portion of unit was modified to remove muskeg and unsuitable timber from unit.

### **Wildlife/TES Plants**

**Concern:** Unit has a small amount (~ 3 acres) of high deer HSI values in northwestern and mid portions of unit. A small amount (~2 acres) of high probability goshawk nesting habitat occurs in the northern portion of the unit. The area is a forested travel corridor to the beach fringe. The unit also lies within a ¼ mile eagle nest buffer. The flight path for helicopter logging Unit J-50 to landings in this unit potentially lies within a ¼ mile of eagle nest buffer.

**Mitigation:** Avoid repeated helicopter flights within ¼ mile of nest from March 1 through May 31. Surveys needed prior to harvest to verify eagle nesting activity. If nest is active continue to avoid repeated helicopter flights through August 31.

### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention from saltwater (the eastern portion of unit is in seen area). From saltwater, unit should appear to be a natural opening.

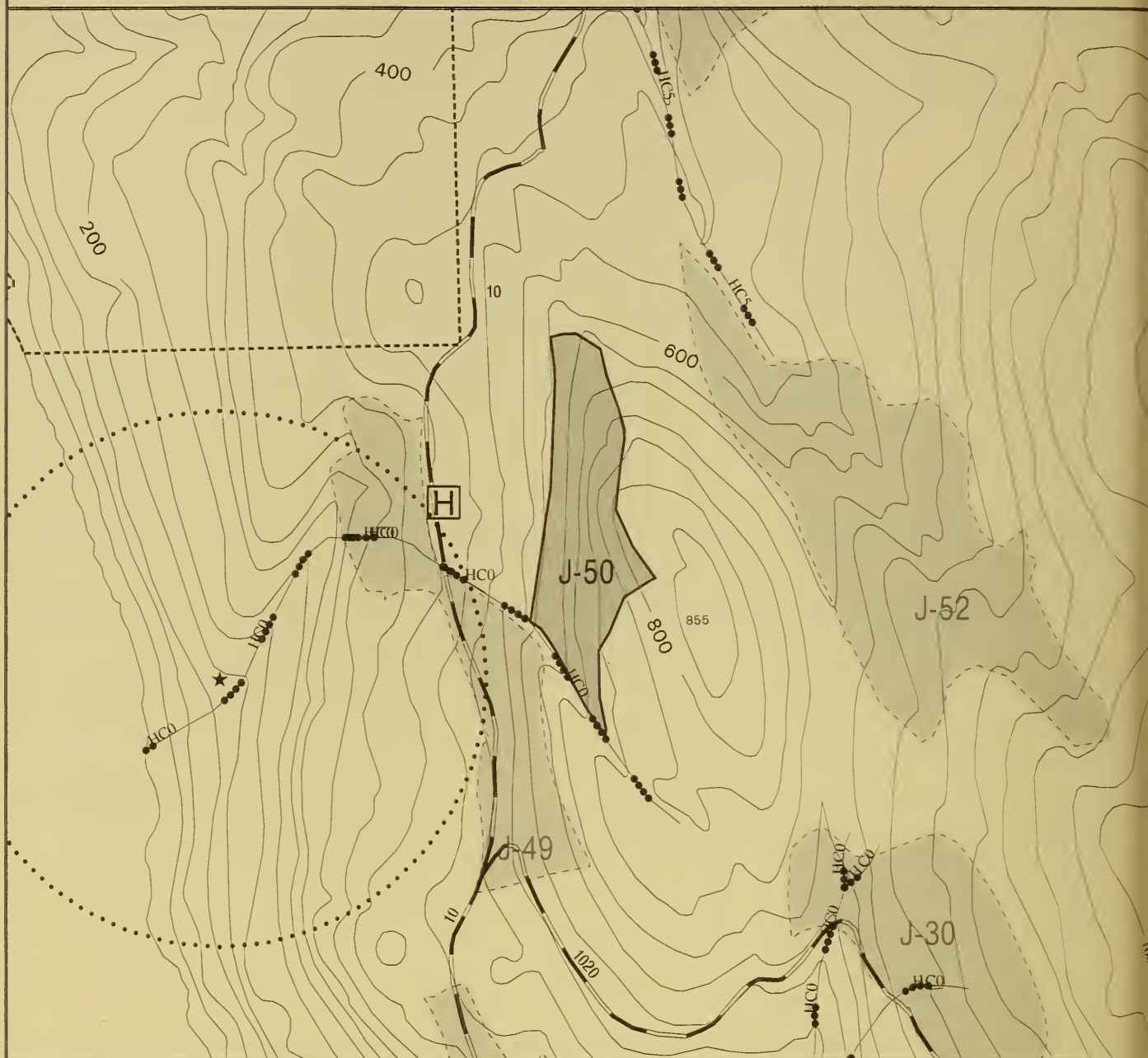
**Mitigation:** Vary the edges and backline of the unit to give the unit a more natural shape. Unit needs a review by a landscape architect during final layout to make sure that layout will achieve the VQO of partial retention.

### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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|----------------------|----------------------|--|----------------------------------|--|------------------------------------|
|                      | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|                      | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|                      | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|                      | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|                      | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|                      | Class 4 Streams      |  |                                  |  | Setting                            |
|                      | 40' Contours         |  | Sort Yards                       |  | State/Private Land                 |
| <b>E</b>             | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| <i>HC1, MM3, ...</i> | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft





Harvest Method: HelicopterTotal Acres: 14Total Volume: 285 MBFVolume per Acre: 21 MBF**UNIT DEVELOPMENT**

Unit designed to meet Visual Quality Objective of partial retention. The southern 1/3 of unit has been dropped due to unsuitable timber. To minimize the potential to create an "edge" effect for visual resources the northern boundary is located just south of the ridgeline. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F18, T1, W6, V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using helicopter using the landings in J-49. One Class IV stream in center of unit requires directional felling (BMP 12.6(a), 13.16). The south 1/3 of the unit was modified to exclude unsuitable timber. The unit has visual concerns from the west; see visuals.

**Specified Roads:** The timber will be flown to the 10 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 71 MBF). Harvest individual trees and/or groups up to 2 acres scattered throughout the unit. Leave a higher percentage of reserve trees in the visible uphill 1/2 of the unit and a lower percentage on non-seen edges. This prescription would address visual, and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees compared with clearcutting. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

## RESOURCE CONCERNS & MITIGATION

### **Watershed/Fisheries**

**Concern:** South unit boundary borders Class IV (HC0) stream flowing directly into Eastern Passage

**Mitigation:** Provide full suspension or split yard, wherever possible, across Class IV streams; at least partial suspension is required (BMP 13.9, 13.16).

### **Soils/Wetlands/Karst**

**Concern:** One area of steep slopes greater than 50% occurs in the northern portion of the unit.

**Mitigation:** Use at least partial suspension in areas of high mass movement potential.

### **Wildlife/TES Plants**

**Concern:** There is a small amount (~3 acres) of high deer HSI value habitat in the western portion of the unit. The flight path for the helicopter logging potentially lies within ¼ mile of eagle nest buffer.

**Mitigation:** Avoid repeated helicopter flights within ¼ mile of nest from March 1 through May 31. Surveys needed prior to harvest to verify eagle nesting activity. If nest is active continue to avoid repeated helicopter flights through August 31.

### **Visual/Recreation**

**Concern:** Meet visual quality objective of partial retention in areas seen from saltwater (most of unit). From saltwater, unit should have a natural shape.

**Mitigation:** Group cuts of 2-acres that run horizontally with contours to minimize visual impacts. Make sure the groups cuts are uneven in shape and randomly spaced within the unit to create a natural pattern of small openings. Leave non-merchantable trees. To minimize the potential of creating a "skyline" condition along the eastern boundary of the unit, the boundary is located just west (downhill) of the ridgeline.

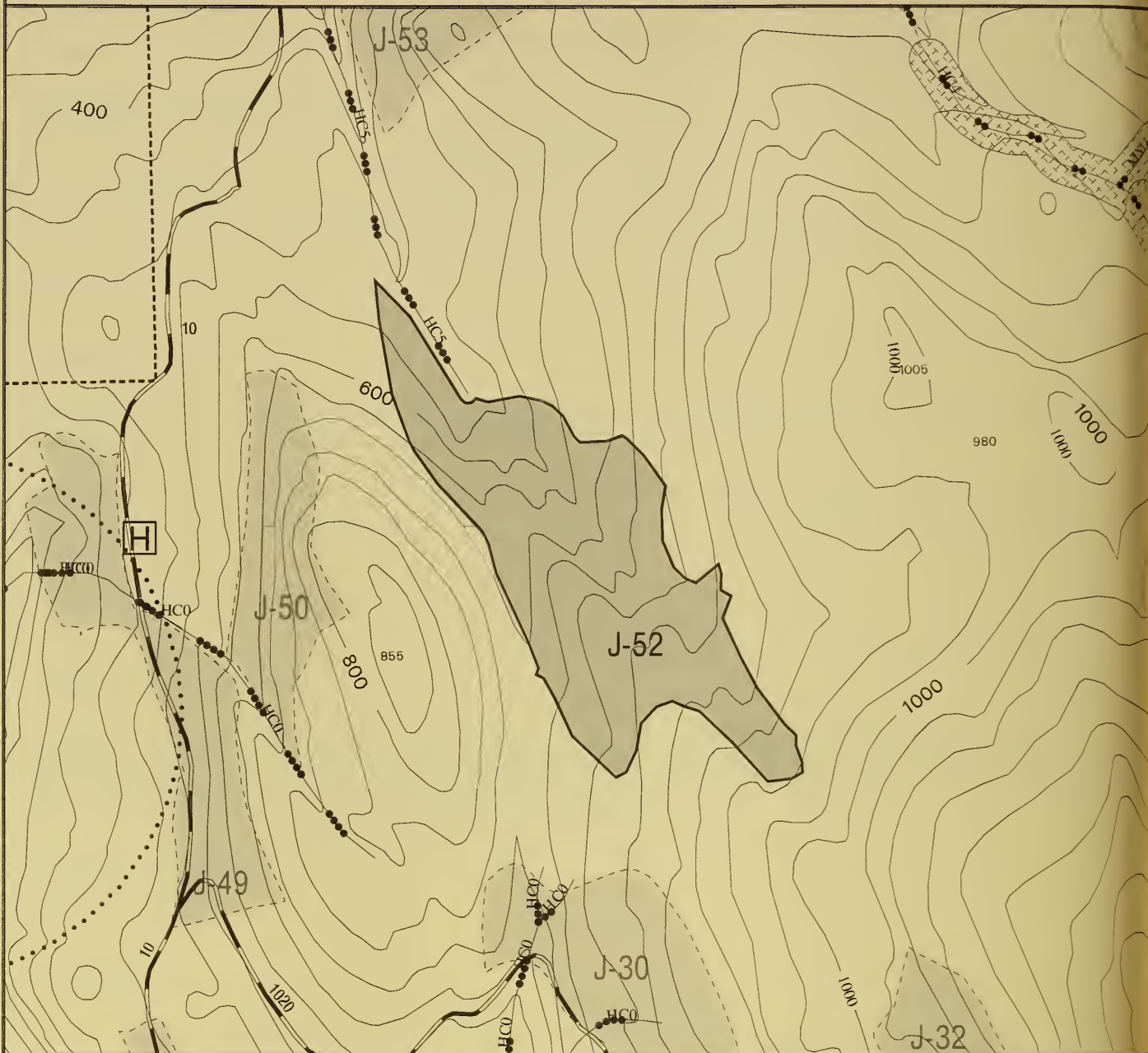
### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

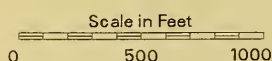
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- |                             |                                  |                                    |
|-----------------------------|----------------------------------|------------------------------------|
| Proposed Spec. Roads        | Potential Helicopter Landings    | Eagle Nest Tree                    |
| Proposed Temp. Roads        | Other Landings                   | Proposed cut units                 |
| Class 1 Streams             | Very High Hazard Soils (MMI4)    | Adjacent proposed units            |
| Class 2 Streams             | 300' Offset From Class 1 Streams | TTRA Buffers                       |
| Class 3 Streams             | Second Growth                    | 1/4 Mile Eagle Nest Timing Buffers |
| Class 4 Streams             | Sort Yards                       | Setting                            |
| 40' Contours                |                                  | State/Private Land                 |
| <b>E</b> Proposed LTF Sites |                                  | Lakes                              |
| HC1, MM3, ... Channel Types |                                  |                                    |

Scale: 1" = 800 ft



## MADAN TIMBER SALE - UNIT CARD    Unit Number J-52 (Old V-52) Selected Alternative

Harvest Method: Helicopter

Total Acres: 42

Total Volume: 866 MBF

Volume per Acre: 21 MBF

### UNIT DEVELOPMENT

Unit was field verified after initial design. Additional field verification is required. Boundaries correspond with mapped suitable timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F11, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:** The timber can be helicopter yarded to the 10 road in J-49 (Alt. 3 yarding distance = 0.5 miles), or to the Jenkins Cove LTF (Alt. 4 yarding distance = 1.0 miles). Small streams likely exists in this unit. The boundaries are intended to be at the limit of merchantable timber. This unit is planned for helicopter yarding, however road access might be feasible.

**Specified Roads:** The timber can be helicopter yarded to the 10 road in unit J-49 for Alt. 3, or the Jenkins Cove LTF for Alt. 4.

**Temporary Roads:** None (This unit could possibly be accessed by a temporary road and conventionally logged.)

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 217 MBF). Harvest individual trees and/or groups up to 2 acres scattered throughout the unit. This unit is not seen from saltwater or other sensitive viewing areas. This prescription would address wildlife and other resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

### RESOURCE CONCERNS & MITIGATION

#### **Watershed/Fisheries**

**Concern:** North unit boundary borders Class III (HC5) tributary to Gypsy Creek. Unit appears to contain other small un-mapped streams. Access by temporary road may require stream crossings.

**Mitigation:** No harvest on sideslope adjacent to Class III streams. (BMP 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required. Restore natural drainage patterns during temporary road obliteration (BMP 13.9, 13.16).

#### **Soils/Wetlands/Karst**

**Concern:** Unit has been field reviewed. No soil, wetland, or karst concerns.

**Mitigation:** None

**Wildlife/TES Plants**

**Concern:** None

**Mitigation:** None

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**Visual/Recreation**

**Concern:** Unit is not seen from saltwater or other sensitive viewing locations.

**Mitigation:** None

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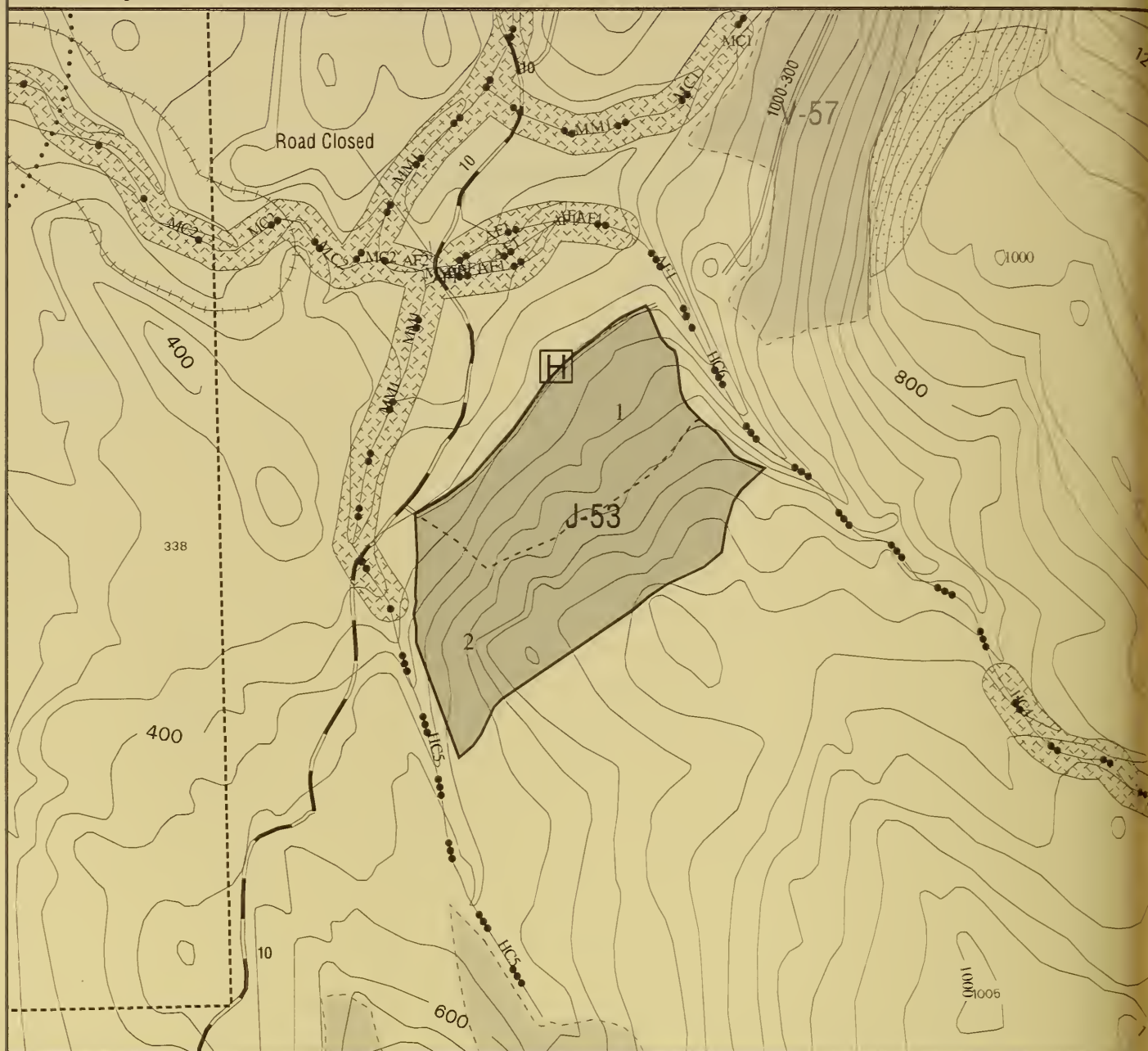
**Other Resources/Issues**

**Concern:** None

**Mitigation:** None



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- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- E** Proposed LTF Sites
- HC1, MM3, ... Channel Types

Scale: 1" = 800 ft

Scale in Feet

0 500 1000

Potential Helicopter Landings

Other Landings

Very High Hazard Soils (MM14)

300' Offset From Class 1 Streams

Second Growth

Sort Yards

Eagle Nest Tree

Proposed cut units

Adjacent proposed units

TTRA Buffers

1/4 Mile Eagle Nest Timing Buffers

Setting

State/Private Land

Lakes

## MADAN TIMBER SALE - UNIT CARD Unit Number J-53 (Old V-53) Selected Alternative

Harvest Method: Running Skyline and Helicopter

Total Acres: 44 Total Volume: 1,310 MBF

Volume per Acre: 30 MBF

### UNIT DEVELOPMENT

Unit designed to meet Visual Quality Objective of partial retention. Boundaries were modified in the field due to unsuitable timber and logging breaks along the southern boundary. Blow down problems (wind from southwest) in the past may limit other possible prescriptions. Unit is accessed by 1000-200 road, which could be visible from Eastern Passage. Multiple tailhold anchors may be required for west side of unit. East landing may require multiple stump or log deck guyline anchors. This unit has visual concerns from the west; see Visual/Recreation section. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, T1, W1, W7, V1, V7, and V13. These measures are described below within the resource sections that apply.

#### Logging and Transportation:

This unit design was changed from the field layout due to visuals concerns, potential blowdown problems, road construction economics, and the inability of cable systems to provide the prescribed visual concern mitigation.

The lower setting can be yarded using a small mobile yarder in a running skyline configuration (and grapples) using the road as a continuous road-side landing. The upper elevation setting can be helicopter yarded down to the landings in the lower setting.

The setting boundary should be the elevation of visual concern and the limit of cable yarding feasibility, whichever is lower in elevation. Two Class III streams near the NE and SW boundaries have slope break buffers (BMP 12.6(a), 13.16). The SE boundary is at the edge of suitable timber. The NW boundary is along the road. The upper 2/3 of the unit has visual concerns from the north and west; helicopter logging will facilitate prescription to mitigate visuals; see visuals.

**Specified Roads:** None (The 10 road is the nearest specified road.) The 1000-200 road is flagged into the upper elevations of the unit, but is not being used. The road has portions of difficult construction, the landings accessed have anchoring problems, would likely be a visual concern, and the length is long when compared to the volume accessed.

**Temporary Roads:** Approximately 2000' of temporary road is needed. Verify location in field during final layout. There was concern over the location of the 10 road stream crossing near the center-west unit boundary. This may effect the temporary road location and length.

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 1,178 MBF). Leave scattered and clumped trees, snags, and non-merchantable trees within 50-100 feet of the unit/setting boundaries, especially in the higher 2/3 of unit. Due to visual concerns special methods are needed. See Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.



## **RESOURCE CONCERNS & MITIGATION**

### **Watershed/Fisheries**

**Concern:** Unit borders Class III (HC5 and HC6) tributaries to Class III Gypsy Creek (MM1). Past windthrow observed in unit. Verification updates: Stream locations and classifications verified after initial unit reconnaissance. Resident fish populations found upstream of previous Class II/III break on west side of unit.

**Mitigation:** No harvest on sideslope adjacent to Class III streams (BMP 12.6, 12.6a). Northeast unit boundary should provide additional buffer width or other consideration for buffer windfirmness. Lower road dropped in favor of higher road, which improves stream crossing and avoids road location concerns in DEIS.

### **Soils/Wetlands/Karst**

**Concern:** None

**Mitigation:** None

### **Wildlife/TES Plants**

**Concern:** Unit contains high deer HSI values in western half of unit. High probability goshawk nesting habitat occurs along the northwestern boundary in 1/3 of unit. Connection between large forested blocks in Jenkins Cove and Virginia Lake blocks could be lost if adjacent State lands are harvested.

**Mitigation:** Reserve trees will enhance snow interception in the future stand.

### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in area visible from saltwater (the higher elevation portions of the unit – about two-thirds).

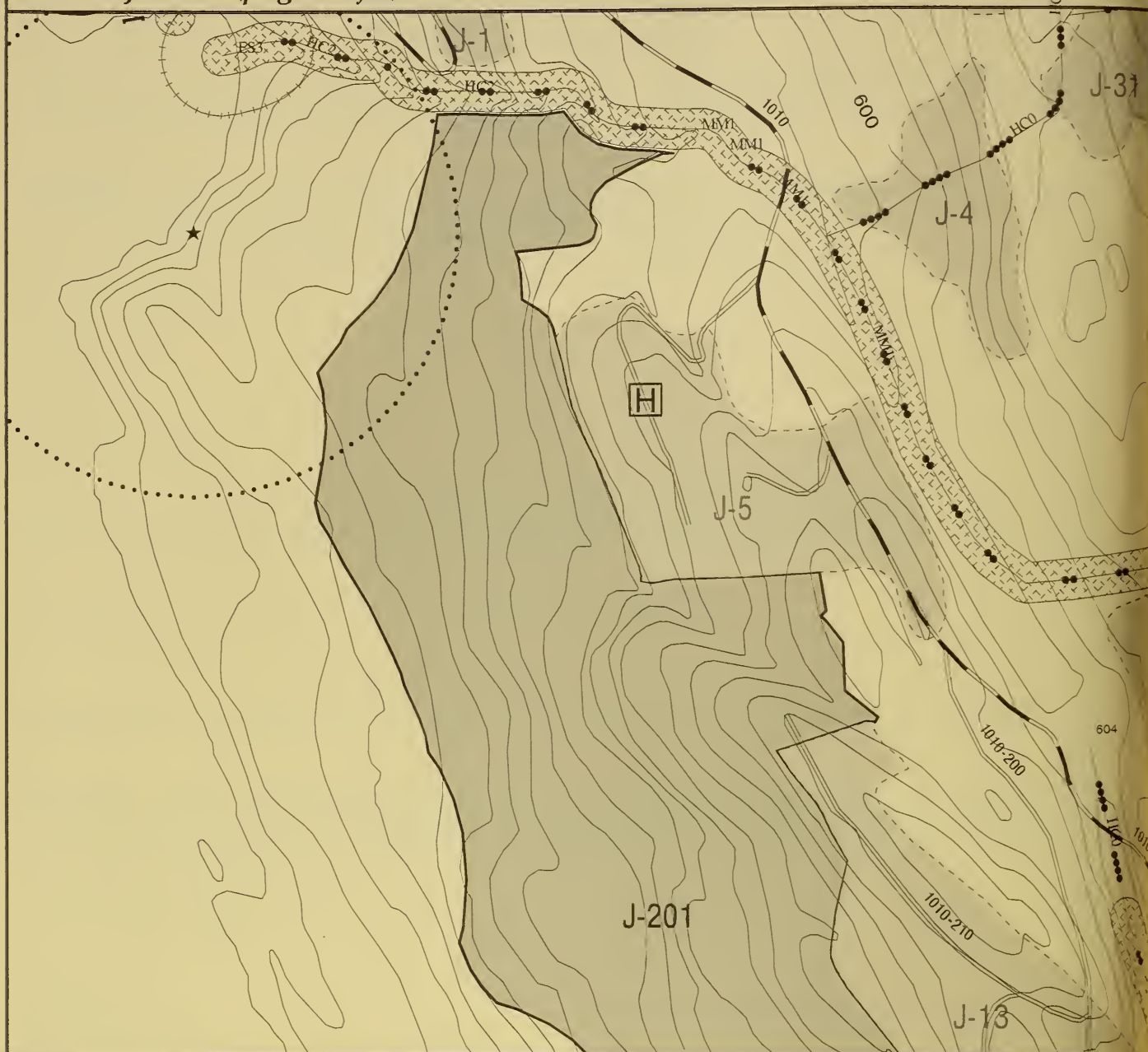
**Mitigation:** Leave enough reserve and unmerchantable trees in the higher portions of unit visible from saltwater. Vary edges and backlines of patch cut boundaries to give them a natural shape. Do not use any straight lines for these patch cut boundaries. Unit needs a review by a landscape architect during final layout to make sure that layout will achieve the VQO of partial retention.

### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- E** Proposed LTF Sites
- HC1, MM3, ... Channel Types

Potential Helicopter Landings

Other Landings

Very High Hazard Soils (MM14)

300' Offset From Class 1 Streams

Second Growth

Sort Yards

Eagle Nest Tree

Proposed cut units

Adjacent proposed units

TTRA Buffers

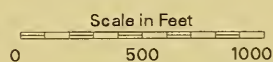
1/4 Mile Eagle Nest Timing Buffers

Setting

State/Private Land

Lakes

Scale: 1" = 800 ft





**MADAN TIMBER SALE - UNIT CARD** Unit Number J-201 Selected AlternativeHarvest Method: HelicopterTotal Acres: 243 Total Volume: 4,414 MBFVolume per Acre: 18 MBF**UNIT DEVELOPMENT**

Unit has not been field verified. Additional field work is required. Boundaries correspond with mapped suitability timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, F18, T1, W6, W8, W13 and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:** This unit design has not been field verified. The timber can be helicopter yarded to the Jenkins Cove LTF or barge in Madan Bay (Alt. 4 yarding distance = 0.5 miles), or yarded to various roads and units to the east (Alt. 3 yarding distance = 0.5 miles). A Class II stream exists on the north tip of the unit, which will need a buffer and directional felling (BMP 12.6(a), 13.16). The west and south boundaries are 1000' beach buffers. The east boundaries are intended to be the logical setting boundaries of adjacent units to the east. This unit could likely be yarded using conventional logging systems if roads were planned.

**Specified Roads:** The timber can be helicopter yarded to the Jenkins Cove LTF or a barge in Madan Bay for Alt. 4, or several roads for Alt. 3. This unit would likely need a specified road if conventionally logged.

**Temporary Roads:** This unit would likely need temporary roads if conventionally logged.

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 1,104 MBF). Harvest individual trees and/or groups up to 2-horizontal acres that follow the contours, scattered throughout the unit. The unit has visual concerns from the west and the south. See Visual/Recreation section. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

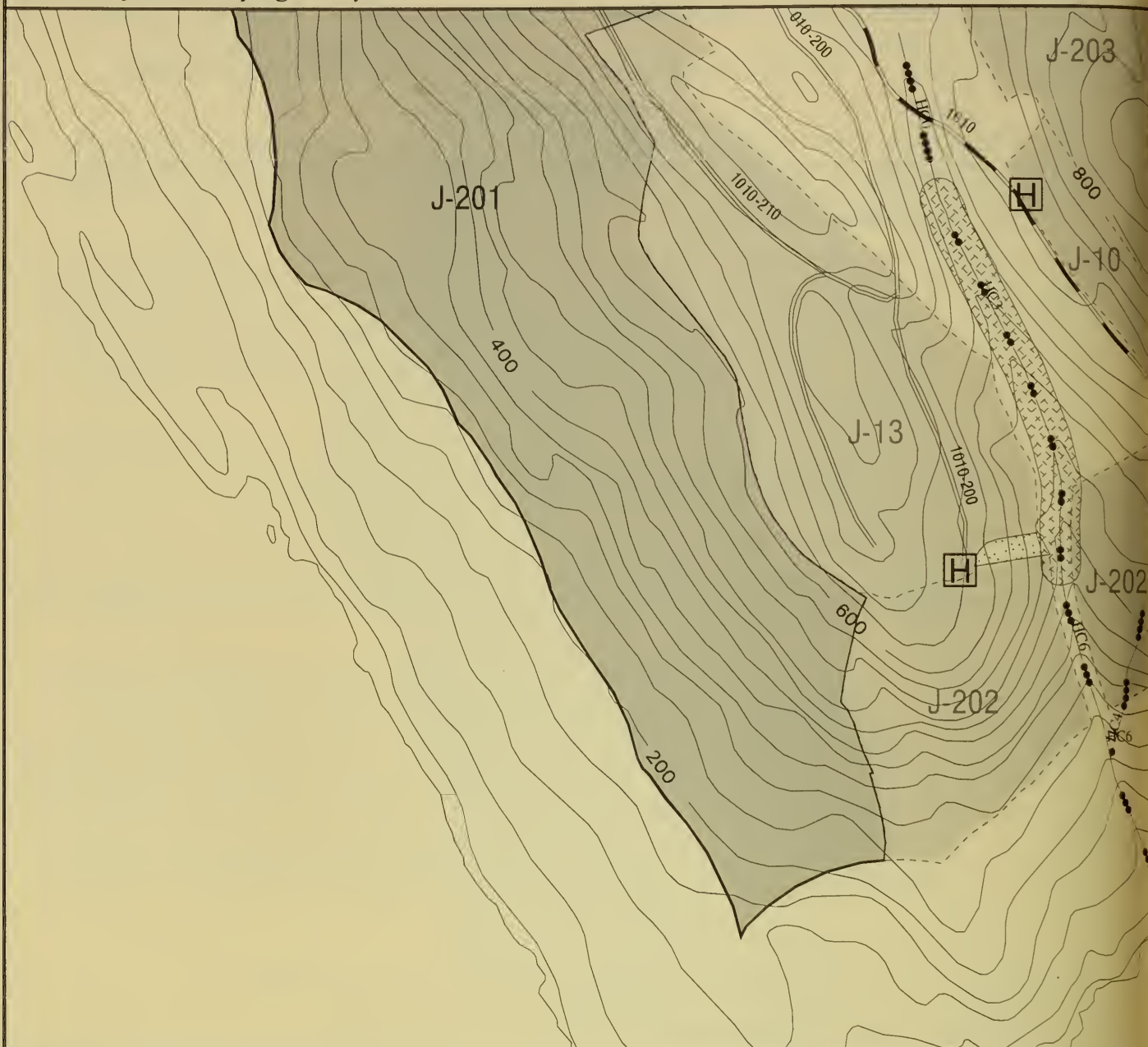
**Concern:** North unit boundary borders Class II Jenkins Creek (HC2). Unit may contain un-mapped Class IV streams flowing into Eastern Passage.

**Mitigation:** Helicopter yarding is expected to provide full suspension across Class IV streams, at least partial suspension is required. Unit provides at least 100-foot (TTRA) no-harvest buffer adjacent to Jenkins Creek, excluding sideslope (BMPs 12.6, 12.6a, 13.9, 13.16).

**Soils/Wetlands/Karst**

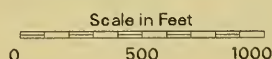
**Concern:** Based on soil mapping and aerial photo interpretation, there are no apparent soil concerns; however, some steeper areas exist.

**Mitigation:** At least partial suspension is required in steeper areas. Helicopter yarding with full suspension, partial harvest retaining 70% of the stand, and selectively placing harvest patches, will protect the soil resources.



- |               |                      |  |                                  |  |                                    |
|---------------|----------------------|--|----------------------------------|--|------------------------------------|
|               | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|               | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|               | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|               | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|               | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|               | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|               | 40' Contours         |  |                                  |  | State/Private Land                 |
| <b>E</b>      | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| HC1, MM3, ... | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



### **Wildlife/TES Plants**

**Concern:** Medium to high value deer winter habitat throughout the unit. The highest values occur in the southern tip of the unit. High probability goshawk nesting habitat occurs in the southwestern 2/3 of the unit. A portion of a ¼ mile eagle nest timing buffer is located in the northernmost portion of the unit near Jenkins Cove.

**Mitigation:** Avoid repeated helicopter flights within ¼ mile of nest from March 1 through May 31. Surveys needed to determine nest activity prior to implementation, if nest is active, continue to avoid repeated helicopter flights through August 31. Individual/Group Selection with a minimum 70% retention will help provide structure and snow interception in future stands. Leave more reserve trees and non-merchantable trees in the southern and western portion of the unit.

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### **Visual/Recreation**

**Concern:** Meet Visual Quality Objectives of partial retention. Most of unit is visible from saltwater. From saltwater the units will be small, horizontal and barely visible.

**Mitigation:** Harvest will consist of individual tree selection or group selection with up to 2-horizontal acres. The group selection will be patch cuts that follow contour lines and are scattered throughout the unit. Make sure the patch cuts are uneven in shape to create a natural pattern of small openings.

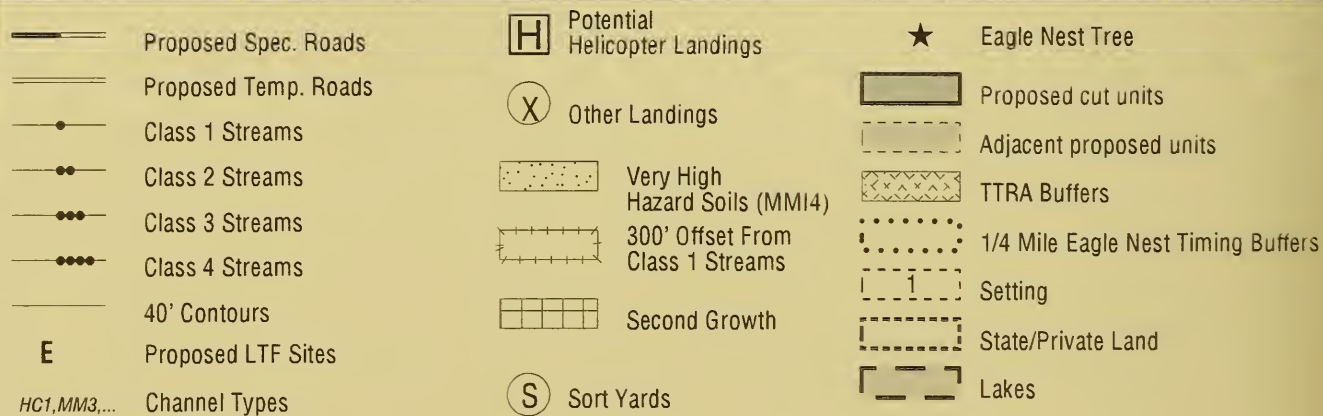
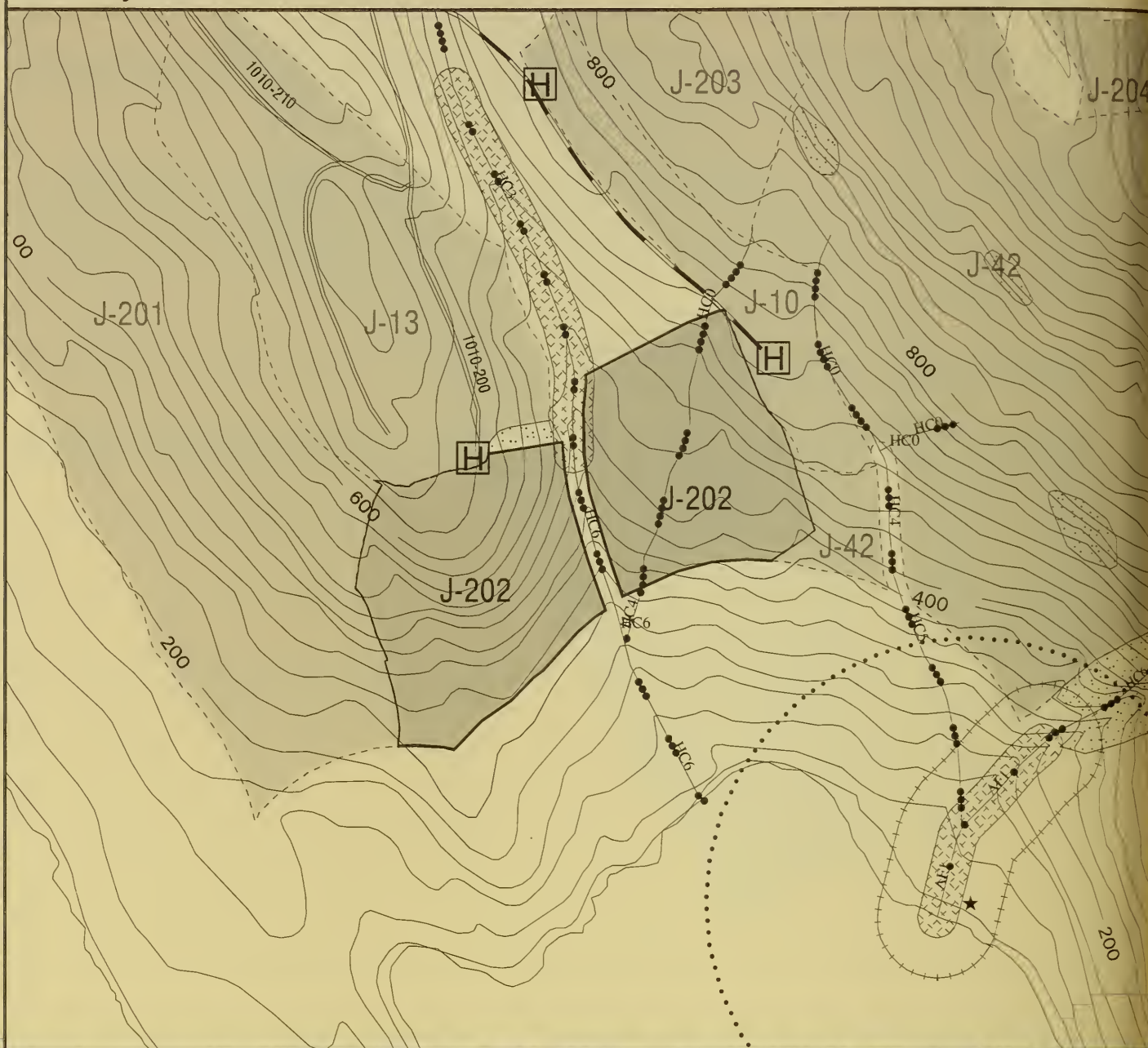
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### **Other Resources/Issues**

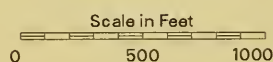
**Concern:** None

**Mitigation:** None





Scale: 1" = 800 ft



**MADAN TIMBER SALE - UNIT CARD**Unit Number J-202

Selected Alternative

Harvest Method: HelicopterTotal Acres: 55Total Volume: 993 MBFVolume per Acre: 18 MBF**UNIT DEVELOPMENT**

Unit has not been field verified. Additional field work is required. Boundaries correspond with mapped suitability timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, F18, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:** This unit has not been field verified. The timber can be yarded to a barge in Madan Bay (Alt. 4 yarding distance = 0.5 miles), or yarded to the 1010 road in J-10 (Alt. 3 yarding distance = 0.5 miles). A stream running south through the middle of the unit needs protection. The southeast boundary is a 1000' beach buffer. The remaining boundaries are intended to be logical setting boundaries. This unit could likely be yarded using conventional logging systems if roads were planned.

**Specified Roads:** The timber can be helicopter yarded to the 1010 road for Alt. 3, or to a barge in Madan Bay for Alternative 4.

**Temporary Roads:** This unit would likely need temporary roads if conventionally logged.

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 248 MBF). Harvest individual trees and/or groups up to 2-horizontal acres that follow contour lines and are scattered throughout the unit. The unit has visual concerns for the west and south; see Visual/Recreation section. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Class II/III (HC3/HC6) stream flowing into Madan Bay bisects unit. Eastern half of unit contains Class IV tributary to this stream. Unit may contain small un-mapped streams. Verification Updates: Isolated cutthroat trout population verified adjacent to harvest unit after initial unit reconnaissance.

**Mitigation:** No harvest within 100 feet of stream (non-TTRA), or on sideslope adjacent to Class II stream, whichever is further. No harvest on sideslope adjacent to Class III stream (BMPs 12.6, 12.6a). Helicopter yarding is expected to provide full suspension across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). Fisheries personnel will assist with final layout.

### **Soils/Wetlands/Karst**

**Concern:** Based on soil mapping and aerial photo interpretation, there are no apparent soil concerns; however, some steep areas exist in the southwestern portion of the unit.

**Mitigation:** At least partial suspension in steeper areas. Helicopter yarding with full suspension, partial harvest retaining 70% of the stand, and selectively placing harvest patches will protect the soil resource.

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### **Wildlife/TES Plants**

**Concern:** Almost the entire unit is high value (HIS) deer winter habitat. High probability goshawk nesting habitat occurs in the southern 1/2 of the unit and in western half of that portion of the unit east of the creek.

**Mitigation:** Individual/Group Selection with a minimum 70% retention will help provide structure in future stands. Leave more reserve trees and non-merchantable trees in the southern portion of the unit and along the eastern side of the creek.

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### **Visual/Recreation**

**Concern:** Meet Visual Quality Objectives of partial retention. Most of unit is visible from saltwater. From saltwater the units will be small, horizontal and barely visible.

**Mitigation:** Harvest will consist of individual tree selection or group selection with up to 2-horizontal acres. The group selection will be patch cuts that follow contour lines and are scattered throughout the unit. Make sure the patch cuts are uneven in shape to create a natural pattern of small openings.

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### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

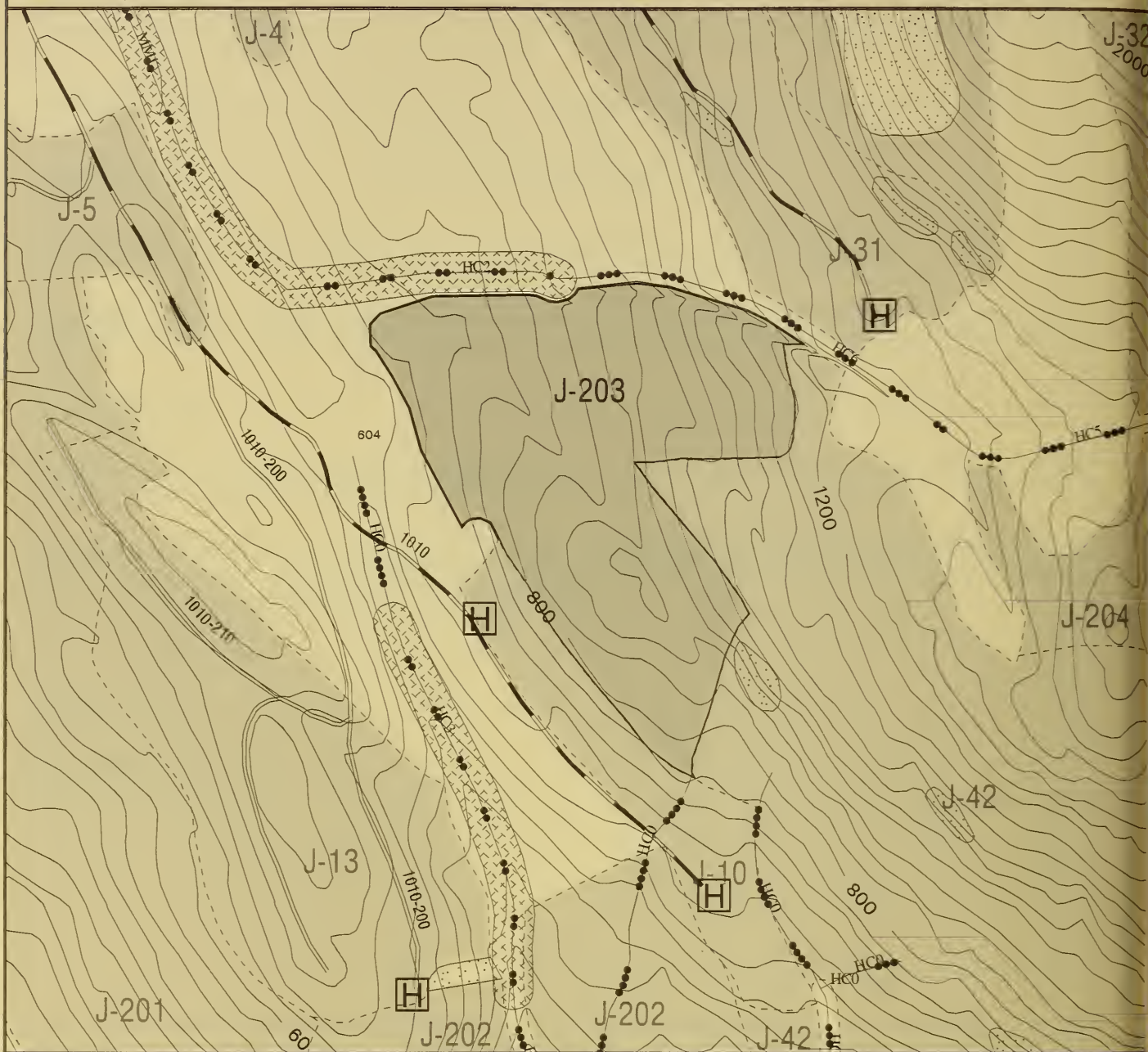
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## UNIT J-203

## 65 ACRES



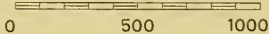
- 
- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams


## E Proposed LTF Sites

HC1, MM3, ... Channel Types

Scale: 1" = 800 ft

Scale in Feet



-  Potential  
Helicopter Landings

- (X) Other Landings

- Very High  
Hazard Soils (MM14)

- 
- 300' Offset From  
Class 1 Streams

- Second Growth

- ⑤ Sort Yards

- ★ Eagle Nest Tree

- ☐ Proposed cut units

- Adjacent proposed units

- 
- TTRA Buffers

- !.....: 1/4 Mile Eagle Nest Timing Buffers

- Setting

- State/Private Land

- Lakes

Harvest Method: HelicopterTotal Acres: 65 Total Volume: 2,937 MBFVolume per Acre: 45 MBF**UNIT DEVELOPMENT**

Unit was field verified after initial unit design. Additional field work is required. Boundaries correspond with mapped suitability timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:** This unit design was field verified after initial unit design. The timber can be yarded to a barge in Madan Bay (Alt. 4 yarding distance = 1.0 miles), or yarded to the 1010 road in J-10 (Alt. 3 yarding distance = 0.5 miles). The Class II stream shown on the north boundary will need a buffer and directional felling; its position may be south of the presently mapped position. The remaining boundaries are intended to be the limit of merchantable timber or logical setting boundaries. Access roads for conventional logging systems are questionable for this unit.

**Specified Roads:** The timber can be helicopter yarded to the 1010 road in J-10 for Alt.3, or to a barge in Madan Bay for Alternative 4.

**Temporary Roads:** This unit would likely need temporary roads if conventionally logged.

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 734 MBF). Harvest individual trees and/or groups up to 2-horizontal acres that follow the contour lines and are scattered throughout the unit. The unit has visual concerns from the west and south; see Visual/Recreation section. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** North unit boundary borders Class II/III Jenkins Creek (HC2/HC6). Unit may contain small un-mapped streams. Access may be provided by temporary road from north.

**Mitigation:** Provide full suspension or split yard, wherever possible, across Class IV streams; at least partial suspension is required. Unit provides at least 100-foot (TTRA) no-harvest buffer adjacent to Jenkins Creek (Class II), excluding sideslope. No harvest on sideslope adjacent to Class III stream. Restore natural drainage patterns during temporary road obliteration (BMPs 12.6, 12.6a, 13.9, 13.16). Fisheries personnel will assist with final layout.



#### **Soils/Wetlands/Karst**

**Concern:** Unit has been field reviewed. No soil, wetland, or karst concerns.

**Mitigation:** None

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#### **Wildlife/TES Plants**

**Concern:** Medium to high value deer winter habitat in the southern tip of the unit.

**Mitigation:** Individual/Group Selection with a minimum 70% retention will help provide structure and snow interception in future stands. Leave more reserve trees and non-merchantable trees in the southern portion of the unit.

---

#### **Visual/Recreation**

**Concern:** Meet Visual Quality Objectives of partial retention. Most of unit is visible from saltwater. From saltwater the units will be small, horizontal and barely visible.

**Mitigation:** Harvest will consist of individual tree selection or group selection with up to 2-horizontal acres. The group selection will be patch cuts that follow contour lines and are scattered throughout the unit. Make sure the patch cuts are uneven in shape to create a natural pattern of small openings.

---

#### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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- |  |                      |  |                                  |  |                                    |
|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft





Harvest Method: HelicopterTotal Acres: 42      Total Volume: 1,890 MBFVolume per Acre: 45 MBF**UNIT DEVELOPMENT**

Unit was field verified after initial unit design. Boundaries correspond with mapped suitable timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:** This unit is best suited for helicopter yarding because an access road would be economically prohibitive. The timber can be yarded to a barge in Madan Bay (Alt. 4 yarding distance = 1.0 miles), or yarded to the 1010 road in J-10 (Alt. 3 yarding distance = 0.5 miles). Three non-fish streams are within the unit and may need protection, especially the eastern streams. The southwest boundary is a logical setting boundary; the southeast boundary is along the Madan Old Growth Reserve; the north boundary is along a stream; and the remaining boundaries are intended to be the limit of merchantable timber.

**Specified Roads:** The timber can be helicopter yarded to the 1010 road in J-10 for Alt.3, or to a barge in Madan Bay for Alternative 4.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 473 MBF). Harvest individual trees and/or groups up to 2-horizontal acres that follow contour lines and are scattered throughout the unit. The unit has visual concerns from the south; see Visual/Recreation section. This prescription would address visual and other resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees compared with clearcutting. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** North unit boundary borders Class III Jenkins HC5. Unit contains Class IV (HC0) tributaries to Jenkins Creek and Madan Bay.

**Mitigation:** Helicopter yarding is expected to provide full suspension across Class IV streams; at least partial suspension or split yarding is required. No harvest on sideslope adjacent to Class III streams. (BMPs 12.6, 12.6a, 13.9, 13.16). Fisheries personnel will assist with final layout.

**Soils/Wetlands/Karst**

**Concern:** Unit has been field reviewed. No soil, wetland, or karst concerns.

**Mitigation:** None

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**Wildlife/TES Plants**

**Concern:** None

**Mitigation:** None

---

**Visual/Recreation**

**Concern:** Meet Visual Quality Objectives of partial retention. Most of unit is visible from saltwater. From saltwater the units will be small, horizontal and barely visible.

**Mitigation:** Harvest will consist of individual tree selection or group selection with up to 2-horizontal acres. The group selection will be patch cuts that follow contour lines and are scattered throughout the unit. Make sure the patch cuts are uneven in shape to create a natural pattern of small openings.

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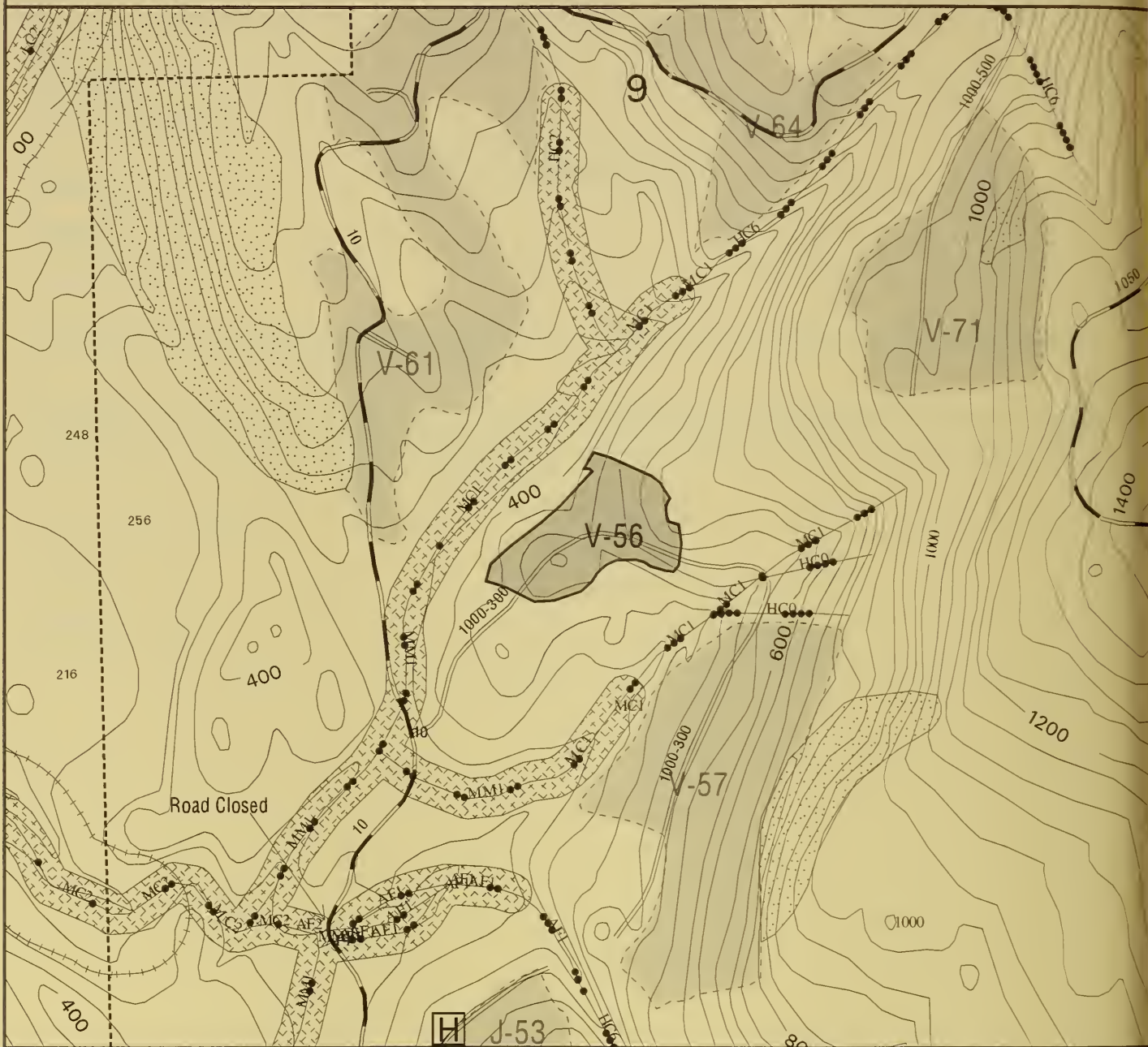
**Other Resources/Issues**






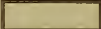




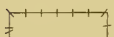





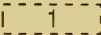






**Concern:** None

**Mitigation:** None

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|--|---------------------------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads                  |   | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads                  |   | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams                       |   | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|  | Class 2 Streams                       |   | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams                       |   | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams                       |  |                                  |  | Setting                            |
|  | 40' Contours                          |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites                    |   | Sort Yards                       |  | Lakes                              |
|  | Channel Types<br><i>HG1, MM3, ...</i> |  |                                  |  |                                    |

Scale: 1" = 800 ft



Harvest Method: Running SkylineTotal Acres: 9Total Volume: 293 MBFVolume per Acre: 33 MBF

### UNIT DEVELOPMENT

Suitable timber limiting on south and northwest boundaries; multiple tailholds may be required. East boundary located on slope break above road. Unit boundaries are generally located 200-300 ft from Class II and III streams. Potential for some blowdown along northeast boundary should be reduced by feathering this cutting boundary with unmerchantable and merchantable reserve trees. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration using the road as a continuous road-side landing. Deflection is adequate. Tail holds are poor along the west side and multiple-stump anchors will be necessary. Portions of the unit can be shovel yarded.

The east boundary is located on a slope break. The class II streams along the SE, south and west sides are 200-300' from the unit. The NE and southern boundaries were modified to exclude unsuitable timber. Blowdown was found near the north boundary and windthrow may be a problem in that area after harvest. The northern portion (upper elevation) of the unit has visual concerns; feathering the northern edge and leaving unmerchantable timber in the northern 1/2 of the unit should screen the unit from view.

**Specified Roads:** The unit is accessed by the 1000-300 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 263 MBF). Leave scattered and clumped trees along with snags and non-merchantable trees within 50 - 100 feet of the unit/setting edge boundaries. Leave at least small trees downhill from road (except near landings) to help screen road. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

### RESOURCE CONCERNS & MITIGATION

**Watershed/Fisheries**

**Concern:** Class II and Class III stream channels adjacent to unit.

**Mitigation:** No programmed harvest within minimum 100 ft TTRA buffer or the top of v-notch, whichever is greater along class II stream. No programmed harvest within v-notch of class III channel. For both Class II and III channels manage beyond no-harvest zone to provide for a reasonable assurance of wind firmness (approximately one site-potential tree height).

**Soils/Wetlands/Karst**

**Concern:** None

**Mitigation:** None

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**Wildlife/TES Plants**

**Concern:** Unit contains high deer HSI values and high probability goshawk nesting habitat in northern half of unit.

**Mitigation:** Reserve trees will enhance snow interception in the future stand.

---

**Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in area visible from saltwater (approx. northern (upper) 1/2 of unit).

**Mitigation:** Leave at least small trees downhill from road (except near landings) to help screen the road from saltwater. Leave scattered reserve trees along with snags and non-merchantable trees within 50 to 100 feet of unit boundaries and vary edges and backlines of unit of northwestern boundary to give unit a more natural shape.

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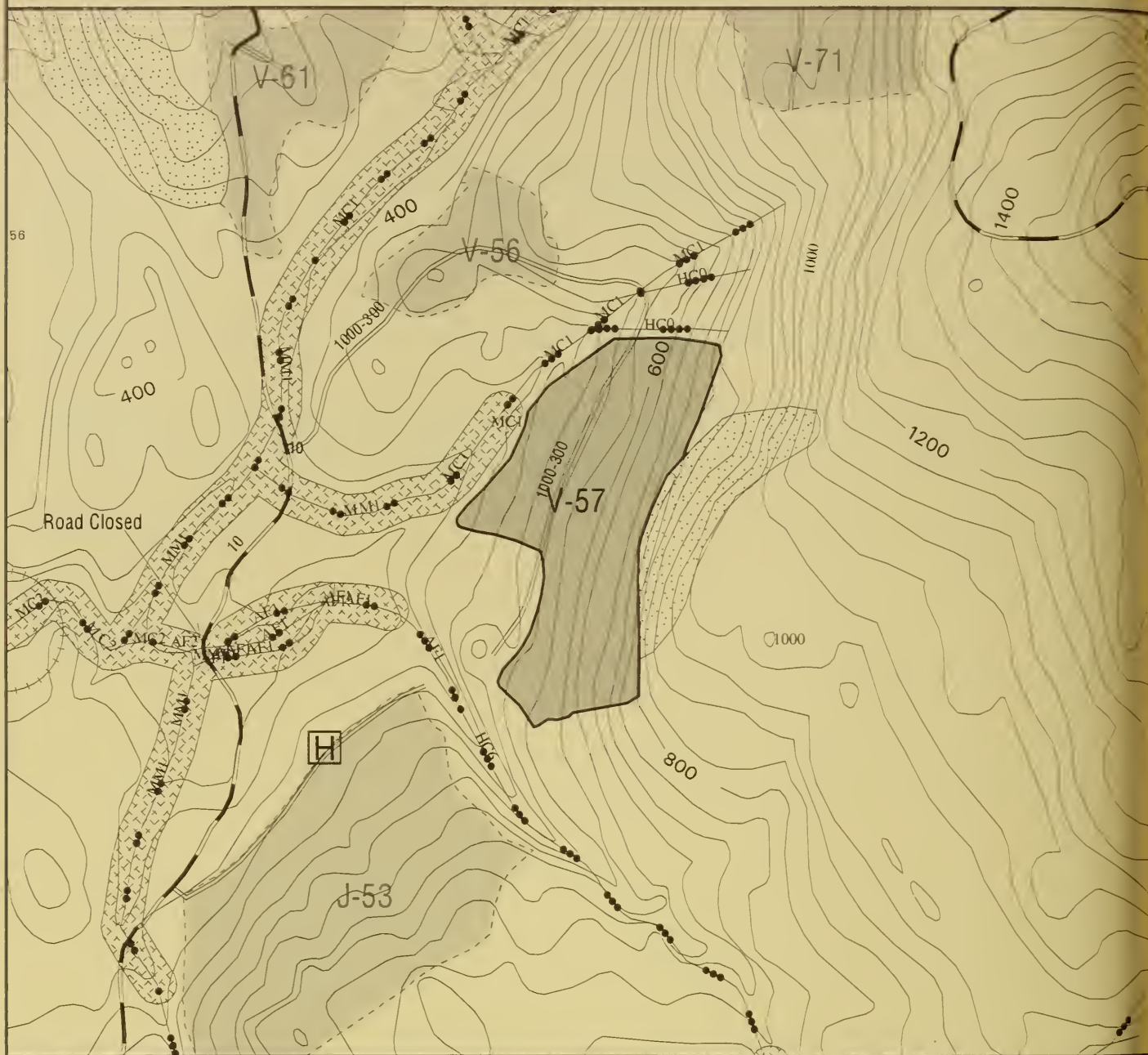
**Other Resources/Issues**

**Concern:** None

**Mitigation:** None

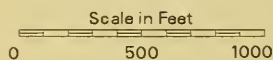


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|---------------|----------------------|--|----------------------------------|--|------------------------------------|
|               | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|               | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|               | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|               | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|               | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|               | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|               | 40' Contours         |  |                                  |  | State/Private Land                 |
|               | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| HC1, MM3, ... | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



Harvest Method: Running SkylineTotal Acres: 30 Total Volume: 997 MBFVolume per Acre: 34 MBF

### UNIT DEVELOPMENT

Unit was designed to meet Visual Quality Objective of partial retention. Visual Quality Objective require prescription other than large clearcut. Boundaries were modified in the field due to unsuitable timber. The eastern portion that was added in the field was later dropped after further field review due to MMI4 soils. There is a Class II/III along the western boundary. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F15, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration using the road as a continuous road-side landing. Deflection is adequate to achieve partial suspension for the downhill yarding.

A Class II/III stream on the NW boundaries has the greater of a 100' or slope break buffer on the Class II portion (12.6(a), 13.16). Another Class III stream exists near the SW boundary. The eastern boundary has been modified after the field layout to exclude MMI4 soils (BMP 13.5). The unit contains insignificant windthrown timber; no blowdown problems are expected after harvest. The upper elevations on the east side have visual concerns from the west. See Visuals/Recreation section.

**Specified Roads:** The unit is accessed by the 1000-300 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 898 MBF). Leave scattered and clumped trees, snags, and non-merchantable trees within 50-100 feet of the unit/setting boundaries. Leave a higher percentage of reserve trees in the seen eastern portion of unit due to visual concerns. See Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allows this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

### RESOURCE CONCERNS & MITIGATION

**Watershed/Fisheries**

**Concern:** Class II, III and IV stream channels adjacent to unit.

**Mitigation:** No programmed harvest within minimum 100 ft TTRA buffer or the top of v-notch, whichever is greater along class II stream. No programmed harvest within v-notch of class III channel. For both Class II and III channels manage beyond no-harvest zone to provide for a reasonable assurance of windfirmness (approx. one site-potential tree height).



### **Soils/Wetlands/Karst**

**Concern:** Soil slips and one landslide present near eastern boundary.

**Mitigation:** Avoid harvest in unstable areas; therefore, eastern portion of unit that was added during initial field review was further modified to remove areas with soil stability concerns.

---

### **Wildlife/TES Plants**

**Concern:** Unit contains high deer HSI values in southern 2/3 of unit. High probability goshawk nesting habitat occurs in the northwestern portion of the unit. Corridor between large forested areas in Jenkins Cove and Virginia Lake blocks would be fragmented.

**Mitigation:** Scatter reserve trees to provide structure in future stand.

---

### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in area visible from saltwater (approx. eastern 1/2 of unit [the upper slopes]).

**Mitigation:** Leave reserve trees downhill from road (except near landings) to help screen the road from saltwater and in patch cut(s) on upper (eastern) slope of unit. Leave scattered reserve trees along with snags and non-merchantable trees within 50 to 100 feet of unit boundaries. Vary edges and backlines of patch cut boundaries to give them natural shapes, and do not use straight lines for boundaries.

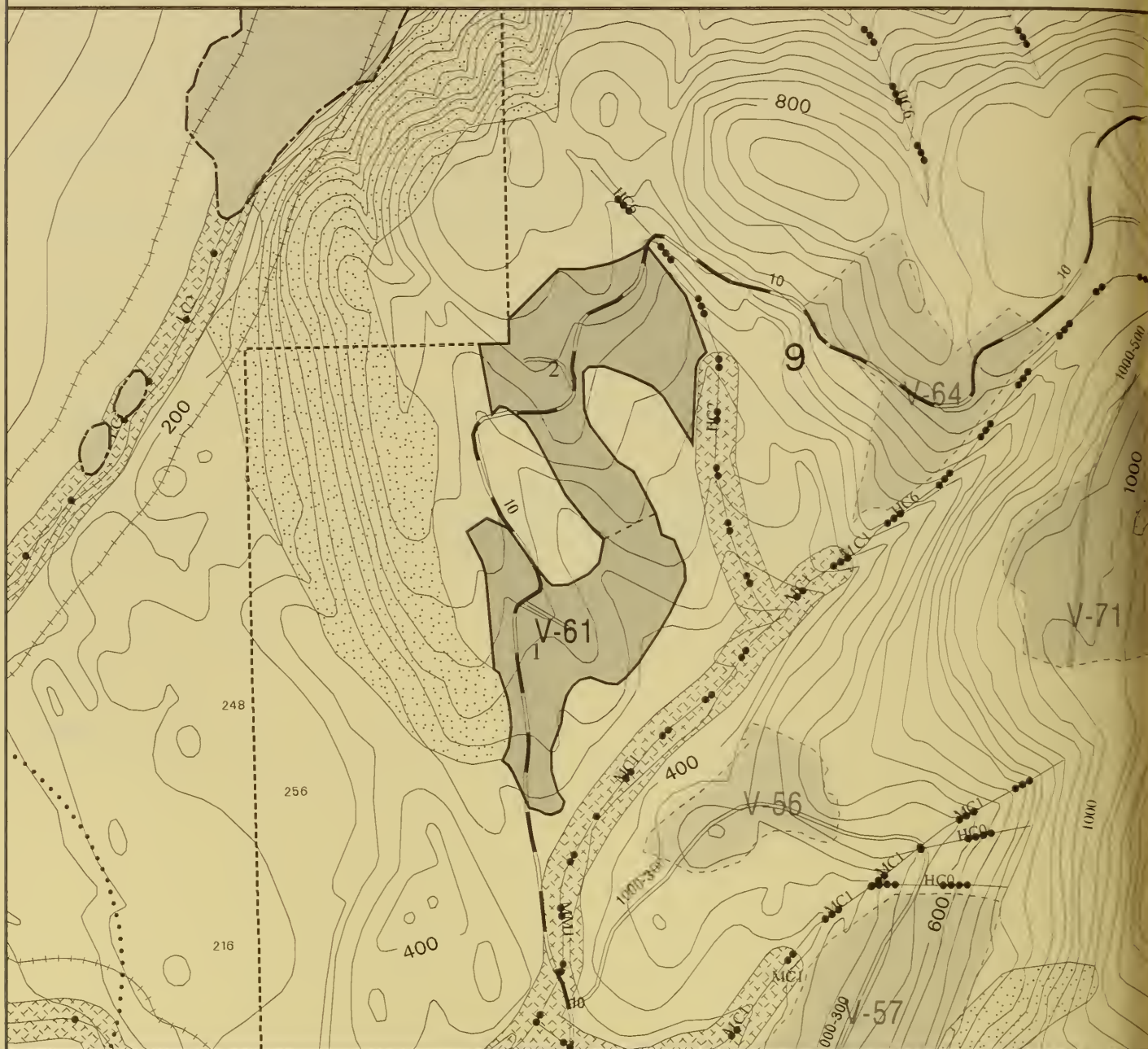
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### **Other Resources/Issues**

**Concern:** None

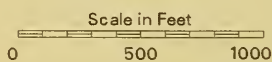
**Mitigation:** None

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|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft





Harvest Method: Running SkylineTotal Acres: 36Total Volume: 627 MBFVolume per Acre: 17 MBF**UNIT DEVELOPMENT**

Unit was modified in the field along the northern and western boundaries due to unsuitable timber. A small portion was added along the southeastern boundary. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F11, T1, W6, W31, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration on both settings using the roads as continuous road-side landings. Deflection is adequate. Tailholds and guyline anchors are poor and multiple-stump anchors, deadman, equipment anchors, or other method will be required to anchor the yarder.

A Class II/III stream is located along the NE boundary which has a 100' buffer on the Class II portion and will require directional felling on the Class III portion (BMP 12.6(a), 13.16). The NW boundary may be along the Property line. Portions of the western edges were modified to exclude timber behind a blind lead (and unsuitable timber). The northern tip was modified to exclude unsuitable timber. The timber contains low volume, highly defective hemlock and yellow cedar. No blowdown problems are expected after harvest. The unit does not have visual concerns.

**Specified Roads:** The unit is accessed by the 10 road.

**Temporary Roads:** Two temporary spurs are needed. Both will need to be about 200 ft. long, totaling 400 ft.

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 157 MBF). Harvest individual trees and/or groups of trees, scattered throughout the unit. The unit has visual concerns from flying into Virginia Lake. Leave a higher proportion of residual trees in the forested muskeg area in the southeastern portion of the unit. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Class II/III stream outside eastern boundary of unit.

**Mitigation:** May need controlled directional felling to keep debris out of stream.

### **Soils/Wetlands/Karst**

**Concern:** Southeast end of unit is forested muskeg (approximately 1 acre); need to move unit boundary to the west to avoid wetland. Much of this unit is characterized by a high water table (<10 inches from surface), poor timber quality/growth, especially in the southern portion of unit.

**Mitigation:** Avoid shovel logging in southern portion of unit to avoid soil compaction.

---

### **Wildlife/TES Plants**

**Concern:** Sensitive plant (*Platanthera chorisiana*) was located in a muskeg approximately 200 ft up-slope of the road location.

**Mitigation:** None needed. Area was dropped from unit due to unsuitable timber.

---

### **Visual/Recreation**

**Concern:** Unit not seen from saltwater but will be visible when flying into Virginia Lake.

**Mitigation:** None needed for views from saltwater. Vary edges and backlines of northeasternmost unit boundary (no straight edge) to give the corner a more natural shape when viewed from airplanes landing at Virginia Lake.

---

### **Other Resources/Issues**

**Concern:** Northwestern boundary borders State land.

**Mitigation:** Ensure that harvest unit boundary is accurately flagged along State land.

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|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft

Scale in Feet

**MADAN TIMBER SALE - UNIT CARD**Unit Number V-64 Selected AlternativeHarvest Method: Running SkylineTotal Acres: 16 Total Volume: 480 MBFVolume per Acre: 31 MBF**UNIT DEVELOPMENT**

Unit designed to meet Visual Quality Objective of partial retention. A small portion of the northeastern lobe has been deferred due to logging feasibility. Unit potentially has a windthrow concern. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration using the road as a continuous road-side landing (BMP13.9, 13.10).

A Class III stream on the SE boundary has a slope-break buffer placed on a ridge (12.6(a), 13.16). The timber is mostly good quality, but has lower quality timber in the NE corner above the 10 road. Occasional blowdown was found on the ridgetop in the center-north unit and there is potential for some blowdown in that area. The upper portion of the unit has visual concerns from the west; see Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 10 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 120 MBF). Harvest individual trees and/or groups of trees, scattered throughout the unit. The unit has visual concerns from flying into Virginia Lake and the upper portion is visible from saltwater. No programmed harvest in v-notch. Ensure that residual trees hide the road from saltwater. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Class III stream along southeastern boundary flows into class II stream.

**Mitigation:** Maintain no harvest slope break buffer along all class III streams (unit does not extend down to class II stream), no programmed harvest within v-notch and manage beyond to maintain windfirm.

#### **Soils/Wetlands/Karst**

**Concern:** None

**Mitigation:** None

---

#### **Wildlife/TES Plants**

**Concern:** Unit contains high deer HSI values in the southern 2/3 of the unit. The southern boundary borders high probability goshawk nesting habitat.

**Mitigation:** Reserve trees will enhance snow interception in the future stand.

---

#### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention from area visible from saltwater (approx. the eastern 1/2 of unit [the upper slopes]). Leave scattered leave tree, snags, and non-merchantable trees and reserve trees between south side of road where possible to screen road from saltwater to the west. Leave other trees along east side of unit.

**Mitigation:** Leave at least small trees downhill from portion of road (except near landings) visible from saltwater to help screen the road. Leave scattered reserve trees along with snags and non-merchantable trees within 50 to 100 feet of unit boundaries. Vary edges and backlines of unit boundary to give it a natural shape. Do not use any straight boundary lines for this unit.

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#### **Other Resources/Issues**

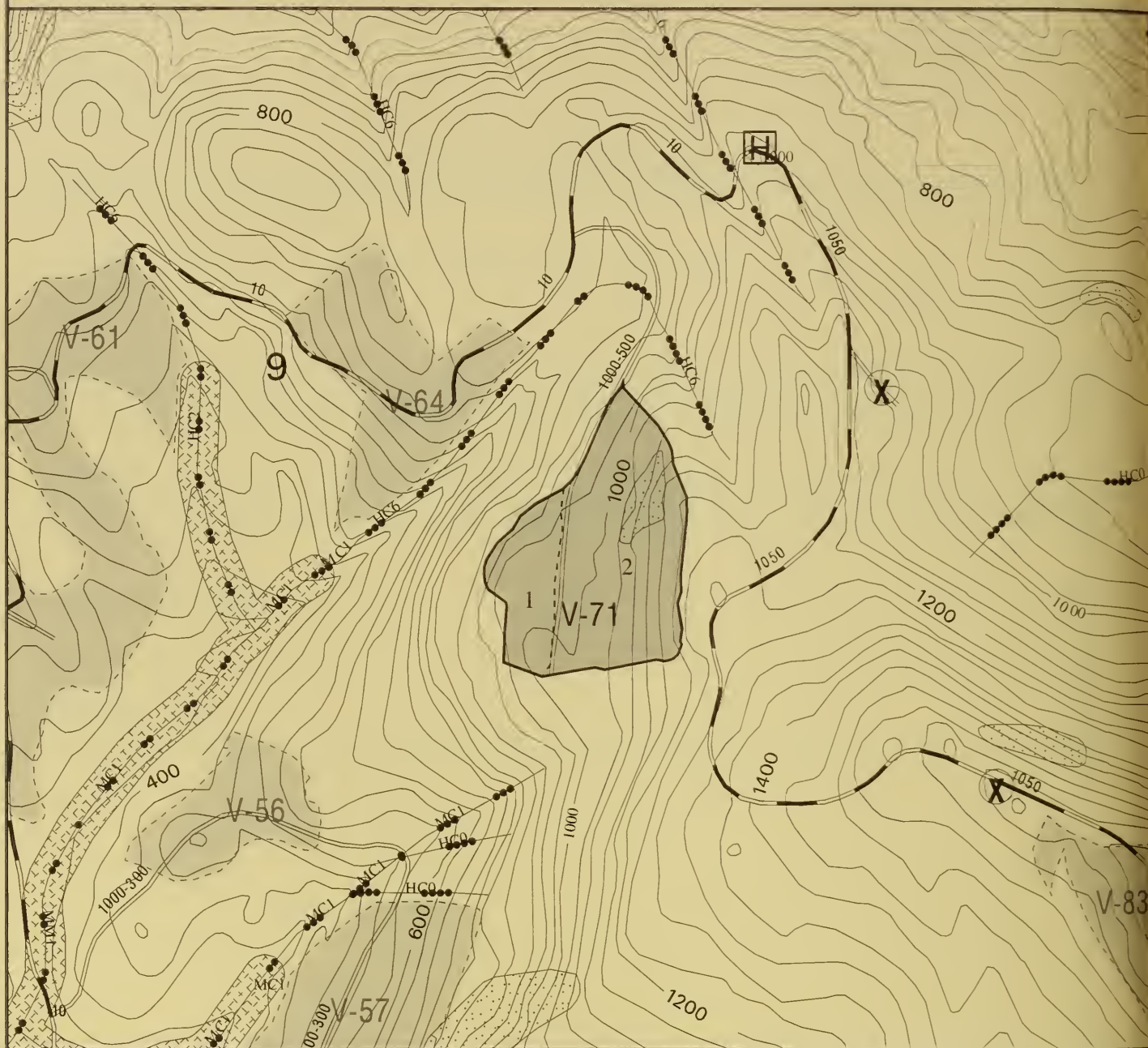
**Concern:** None

**Mitigation:** None

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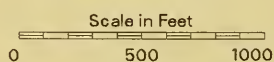


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|---------------|----------------------|--|----------------------------------|--|------------------------------------|
|               | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|               | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|               | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|               | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|               | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|               | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|               | 40' Contours         |  |                                  |  | State/Private Land                 |
|               | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| HC1, MM3, ... | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



**MADAN TIMBER SALE - UNIT CARD**Unit Number V-71 Selected AlternativeHarvest Method: Running Skyline and shovelTotal Acres: 22Total Volume: 571 MBFVolume per Acre: 26 MBF**UNIT DEVELOPMENT**

Unit designed to meet Visual Quality Objective of partial retention. Unit was expanded along the eastern boundary in the field. The expanded area has not been field reviewed for resource concerns. Southern and western boundaries were modified due to logging constraints. Along the original eastern boundary there is an area with potentially unstable steep slopes. Avoid harvest in this area. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F15, F18, T1, W5, and V5. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration and a shovel using the roads as continuous road-side landings. Deflection is adequate. The eastern setting which is planned for a running skyline, was expanded easterly after the field layout to include timber on the ridge on the east side; verify unit expansion during final layout.

The west boundary follows a slope-break. Small streams near the south boundary may require partial suspension which can be achieved (BMP 12.6(a), 13.16). The timber is good quality. No blowdown was encountered and no windthrow problems are expected after harvest. The unit may have visual concerns from the west. See Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 1000-500 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small patches of even-aged stands surrounded by larger patches of old growth.

**Silvicultural Prescription:** Patch Cuts with Minimum 60% retention (estimated harvest volume = 171 MBF). Harvest in patches up to 5-acres, remove approximately 30% of the basal area in each entry with 30 - 40 years between entries. Retain 10% of the basal area as permanent retention throughout the rotation. Avoid placing patches in areas of steep or unstable slopes (especially eastern portion). Leave non-merchantable timber at edges. This prescription would address visual, watershed, soils and wildlife resource concerns. Harvest approximately 30% of the stand every 30 to 50 years by harvesting small areas up to 5 acres in size, scattered through the unit. Future entries will maintain a minimum of 60% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest primarily second-growth trees. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning as well as future entries similar to this patch cut harvest in 30 to 50 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** No fisheries concerns, shallow slide noted by other resource specialist at north end of unit.

**Mitigation:** Avoid disturbance of unstable soils. Split yard or use partial suspension for small streams near south boundary.



**Soils/Wetlands/Karst**

**Concern:** Unstable steep slopes (approximately 100%) with shallow soils along the original eastern boundary. The expanded portion to the east has not been field verified to determine if steep or unstable slopes exist.

**Mitigation:** Avoid harvest in the areas with steep slopes. Need geotechnical review of area of expansion to the east during final layout.

---

**Wildlife/TES Plants**

**Concern:** None

**Mitigation:** None

---

**Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention from area visible from saltwater (approx. eastern 1/3 of unit [upper slope]).

**Mitigation:** Leave scattered reserve trees along with snags and non-merchantable trees within 50 to 100 feet of unit boundaries and vary edges and backlines of southern and eastern unit boundaries to give unit a more natural shape. Do not use any straight boundary lines for this unit.

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**Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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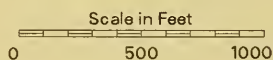


- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- Proposed LTF Sites
- Channel Types

- Potential Helicopter Landings
- Other Landings
- Very High Hazard Soils (MMI4)
- 300' Offset From Class 1 Streams
- Second Growth
- Sort Yards

- Eagle Nest Tree
- Proposed cut units
- Adjacent proposed units
- TTRA Buffers
- 1/4 Mile Eagle Nest Timing Buffers
- Setting
- State/Private Land
- Lakes

Scale: 1" = 800 ft





**MADAN TIMBER SALE - UNIT CARD**Unit Number V-83

Selected Alternative

Harvest Method: Running Skyline, Shovel, Live Skyline, HelicopterTotal Acres: 94Total Volume: 3,609 MBFVolume per Acre: 38 MBF**UNIT DEVELOPMENT**

Unit boundaries were modified to include good timber along edges and to drop areas of unsuitable timber (western boundary). Some of the southern portion has been dropped due to MMI4 soils. Helicopter yarding required in southern portion of unit below MMI4 soils. To compensate for area dropped due to MMI4 soils, Unit V-84 has been incorporated into this unit. This unit has not been visited by a geotechnician, therefore, need final review of slope stability by geotechnician during final implementation. Southwest boundary placed along edge of suitable timber. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F15, F18, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The west, east, and central settings can be yarded with a small mobile yarder in a running skyline configuration. All of these settings can use the roads as continuous road-side landings. The west and central settings require building a short temporary road. Most of the central setting can be yarded to the 1050-190 road used as a continuous road-side landing. The NW setting can be shovel logged to the 1050 road, which can be used as a continuous road-side landing. The central-east setting can be yarded with a large tower in a live skyline configuration. The southernmost setting can be yarded with a helicopter to landings in adjacent settings. Note that this is an uphill flight. Tailholds are poor on portions of the west boundary and multiple-stump anchors may be necessary.

A Class IV stream in the center of the unit can be split-yarded and will require directional felling (BMP 12.6(a), 13.16). The northern and eastern portions of the unit may have visual concerns from the west; see visuals. Since the southern boundary was modified to exclude MMI4 soils (BMP 13.5), the center north setting (V-84) was added (after field layout) to compensate for the volume loss; verify during final layout. The SW boundary was placed along the edge of suitable timber. The north boundary is along the road. The NE boundary follows a ridge. This unit is not visible from Virginia Lake but it is partially visible from the west. See Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 1050, 1050-200, and the 1050-190 roads.

**Temporary Roads:** Two temp roads are needed: one is approximately 600' long, one is approximately 150' long.

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 3,247 MBF). Leave scattered and clumped trees along with snags and non-merchantable trees within 50 - 100 feet of the unit/setting edge boundaries especially the northern and eastern upper slopes. Potential visual concerns for road; see Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allow this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

## **RESOURCE CONCERNS & MITIGATION**

### **Watershed/Fisheries**

**Concern:** At least four Class IV streams present in unit. Steep side slopes and MMI4 soils present.

**Mitigation:** Split yard or provide suspension over class IV streams. When possible, avoid disturbance to area with excess slope angle and sensitive soil types.

### **Soils/Wetlands/Karst**

**Concern:** Southern portion of unit has an MMI4 soils; seeps/springs common near top of very steep slope.

**Mitigation:** Dropped MMI4 area from that portion of the unit that has been field verified. Need geotechnical review of area to be added (old Unit 84).

### **Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal/travel problems.

**Mitigation:** Scatter reserve trees through out unit to maintain structure throughout to allow dispersal.

### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in areas visible from saltwater (northern and easternmost upper slopes).

**Mitigation:** Leave trees in front of road and landing where possible. Leave most reserve trees in eastern portions of unit.

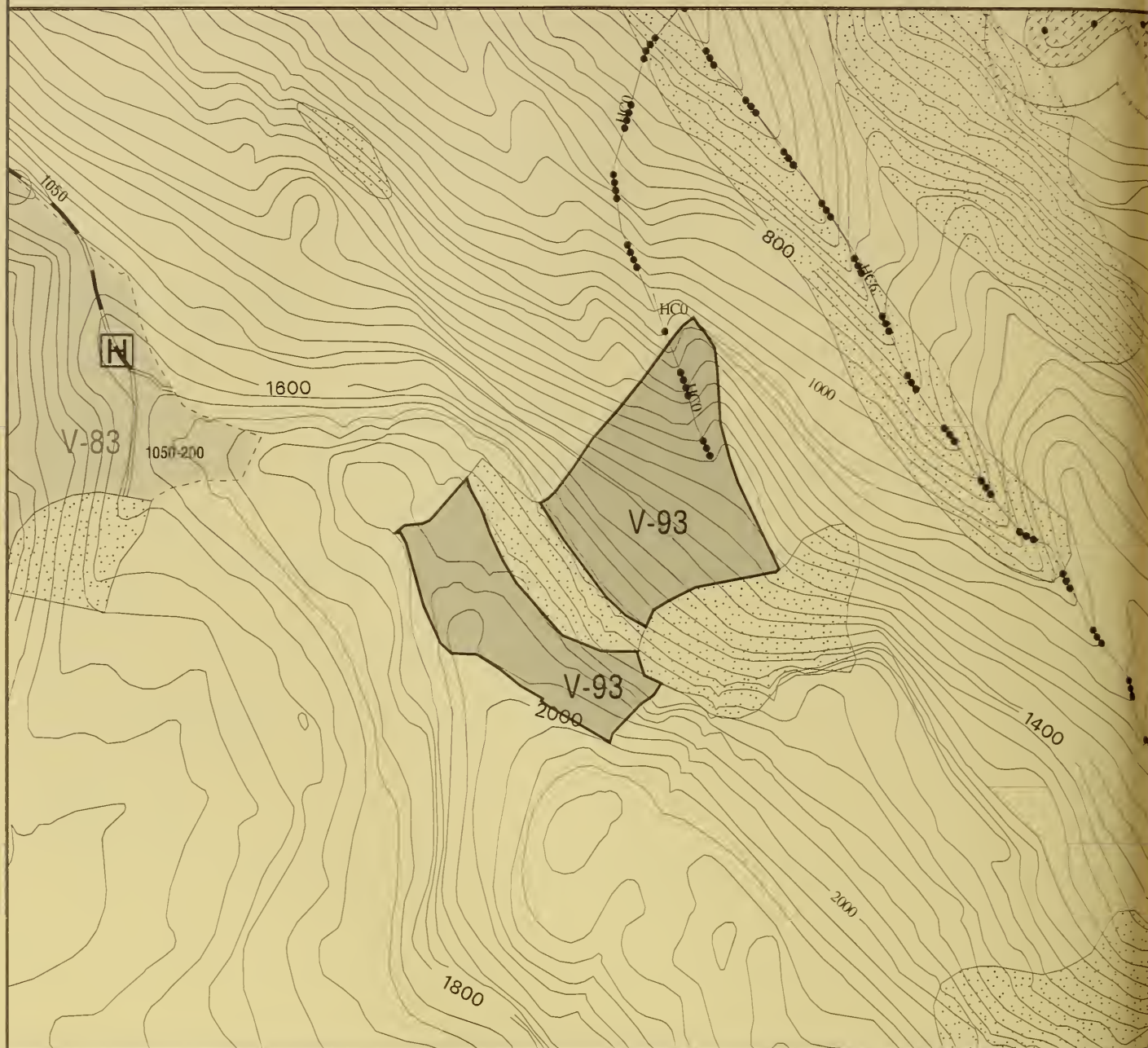
### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



**MADAN TIMBER SALE - UNIT CARD**Unit Number V-93 Selected AlternativeHarvest Method: HelicopterTotal Acres: 35Total Volume: 1,502 MBFVolume per Acre: 43 MBF**UNIT DEVELOPMENT**

This unit has MMI4 soils just below the original road which was an extension of the 1050 road into the southern (upper) portion of the unit. Therefore, could not reach lower portion of unit except by helicopter. Cable logging upper unit would require 1/2 mile of specified road with some difficult construction and therefore is not economically feasible. So unit was changed to all helicopter logging. There is a Class IV (orange and white) that requires a slope break buffer, which will also protect karst features. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F15, K3, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a helicopter to landings in unit V-83. The 1050 road has been flagged into the SW or top of the unit, but due to the removal of area having MMI4 soils (BMP 13.5), the lower portions were isolated. At this point it was no longer economical to build the road (which has some difficult construction) to access the small amount of timber that could be yarded to the road; and therefore, the entire unit was changed to helicopter.

A Class IV stream in the eastern 1/2 of the unit that flows NE and N then NW needs directional felling (BMP 13.16) and a slope-break buffer (BMP 12.6(a)). Field crews mentioned the possibility of karst and grikes. The eastern part of this unit is visible from Virginia Lake. See Visual/Recreation section.

**Specified Roads:** None (The timber will be flown to the 1050 road.)

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 1,352 MBF). Harvest in the upper portion of unit and the lower portion (below MMI4 soils) and leave slope break buffer along Class IV disappearing stream to protect stream and karst features. Leave scattered and clumped trees and snags and non-merchantable timber especially in northern and eastern portion of the unit; see Visual/Recreation section. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allow this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Class IV (orange/white) channel bisects lower portion of unit, possible karst. MMI4 soils present.

**Mitigation:** Helicopter lower portion (below MMI4 soils) and leave slope break no-harvest buffer along Class IV disappearing stream to protect stream and karst features.



#### **Soils/Wetlands/Karst**

**Concern:** Below the original road (see Logging and Transportation), 200 ft are slopes greater than 72%, therefore, MMI4 soils. There is a break in slope below where terrain is more gentle and stable. Marble/limestone found in stream but not extensive features.

**Mitigation:** Unit has been modified to avoid harvest on MMI4 soils. In final unit layout, a karst specialist will further evaluate the unit for karst. The unit boundary will be adjusted to avoid harvest on high vulnerability karst. Slope break buffer on stream should protect any potential karst features along stream area.

---

#### **Wildlife/TES Plants**

**Concern:** Potential fragmentation of connected forested blocks between Virginia Lake and Moose Creek which provides a corridor over the lowest elevation pass between the 2 blocks.

**Mitigation:** The area with MMI4 soils as well as reserve trees and stream buffers will help minimize fragmentation of the corridor.

---

#### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention when viewed from Virginia Lake (the northern portion of unit can be seen from Virginia Lake).

**Mitigation:** Vary edges and backlines of unit boundaries to give unit a more natural shape when viewed from Virginia Lake. Do not use any straight boundary lines for this unit. Leave scattered leave trees, snags, non-merchantable trees and especially reserve trees up and downslope in the central portion of the northern part of this units. This will allow the unit to resemble the natural openings that occur further up the valley.

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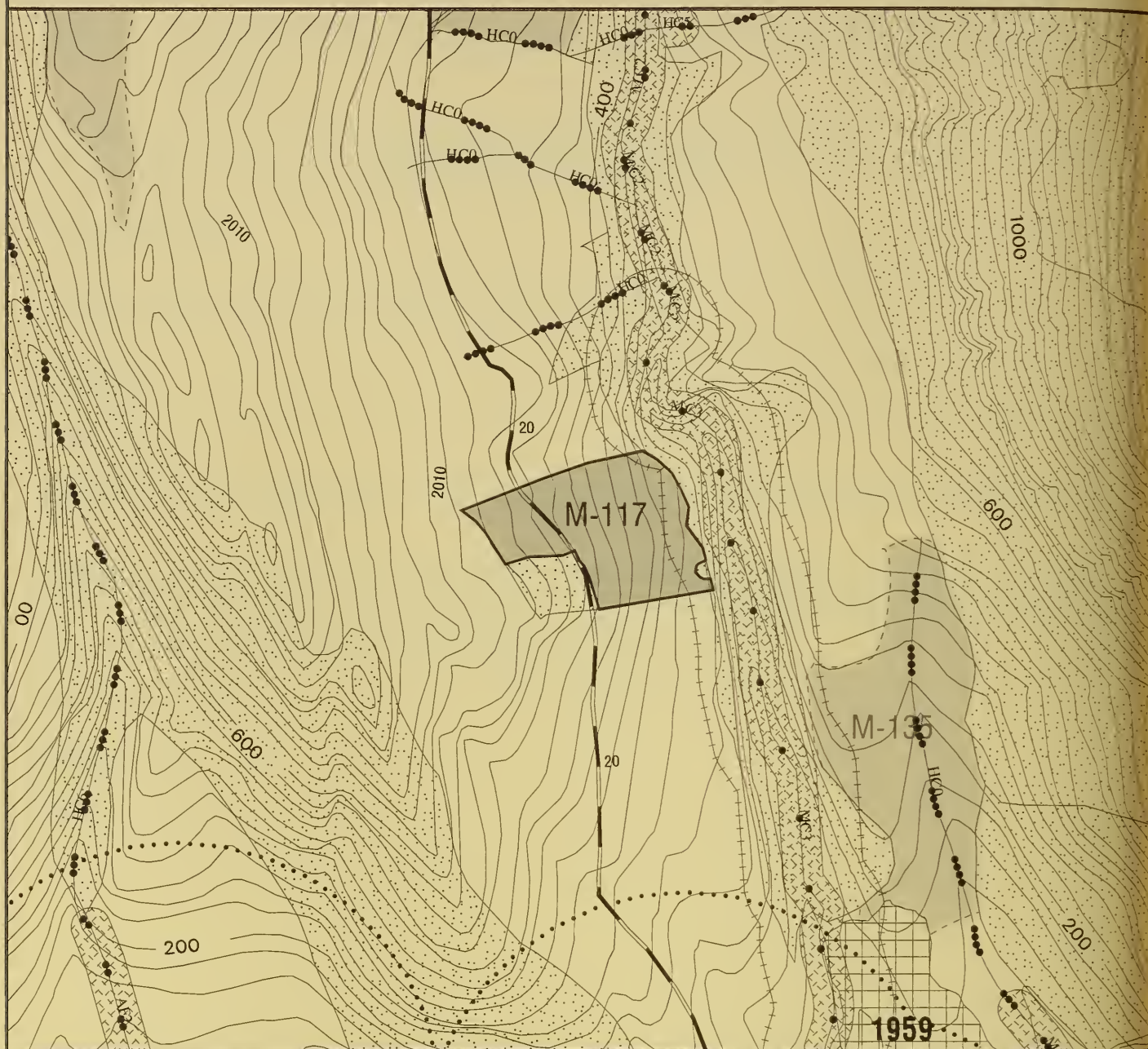
#### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None



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- |  |                      |  |                                  |  |                                    |
|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|  | 40' Contours         |  |                                  |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



Harvest Method: Running SkylineTotal Acres: 13Total Volume: 335 MBFVolume per Acre: 26 MBF**UNIT DEVELOPMENT**

Unit designed to avoid MMI4 soils in the southwest corner of the unit. Boundary moved away from slide in the southeast quarter. Finalize boundary around slide area during field review and implementation. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F3, F4, F15, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration using the 20 road as a continuous road-side landing. To protect the area around and above the slide on the east boundary, split yarding and directional felling is recommended. Deflection is good. Tailholds are adequate. The east boundary is located on a slope break > 100' from the Class I stream, Moose Creek (BMP 12.6(a), 13.16). The SW corner was deleted due to MMI4 soils (BMP 13.5). Windthrow is not anticipated be a problem after harvest. This unit has visual concerns from Blake Channel to the south. See Visual/Recreation section.

**Specified Roads:** The unit is accessed by the 20 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 302). Leave scattered and clumped trees along with snags and non-merchantable trees within 50 - 100 feet of the unit/setting edge boundaries. Leave more trees along boundaries with steep slopes and in western lobe of the unit for visual reasons. Clearcutting with reserve trees is proposed because unit size, configuration, and use of reserve trees allow this prescription to meet the Visual Quality Objective of partial retention. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** East unit boundary approaches Class I Moose Creek (MC3). Unit contains un-mapped Class IV (HC0) tributaries to Moose Creek.

**Mitigation:** Unit excludes sideslope adjacent to Moose Creek, providing at least 100-foot (TTRA) no-harvest buffer. Provide full suspension or split yard, wherever possible, across Class IV streams; at least partial suspension is required. (BMPs 12.6, 12.6a, 13.9, 13.16).



#### **Soils/Wetlands/Karst**

**Concern:** Steep slope in southwestern portion of unit could produce slides if disturbed (see map). Small slide on SE corner identified by layout team. Slide needs to be further defined by implementation team.

**Mitigation:** Excluded MMI4 soils in southwest and slide area in southeast from unit.

---

#### **Wildlife/TES Plants**

**Concern:** The eastern half of the unit is high probability goshawk nesting habitat.

**Mitigation:** None needed.

---

#### **Visual/Recreation**

**Concern:** Meet visual quality objective of partial retention when viewed from Blake Channel (northern and western [up slope] portions of units are visible from saltwater).

**Mitigation:** Leave reserve trees in western lobe above road for visual concerns. Leave non-merchantable and some merchantable trees within 50-100 feet of unit boundaries. Vary edges and backline of unit (do not make any boundaries straight edges) to give unit a more natural shape.

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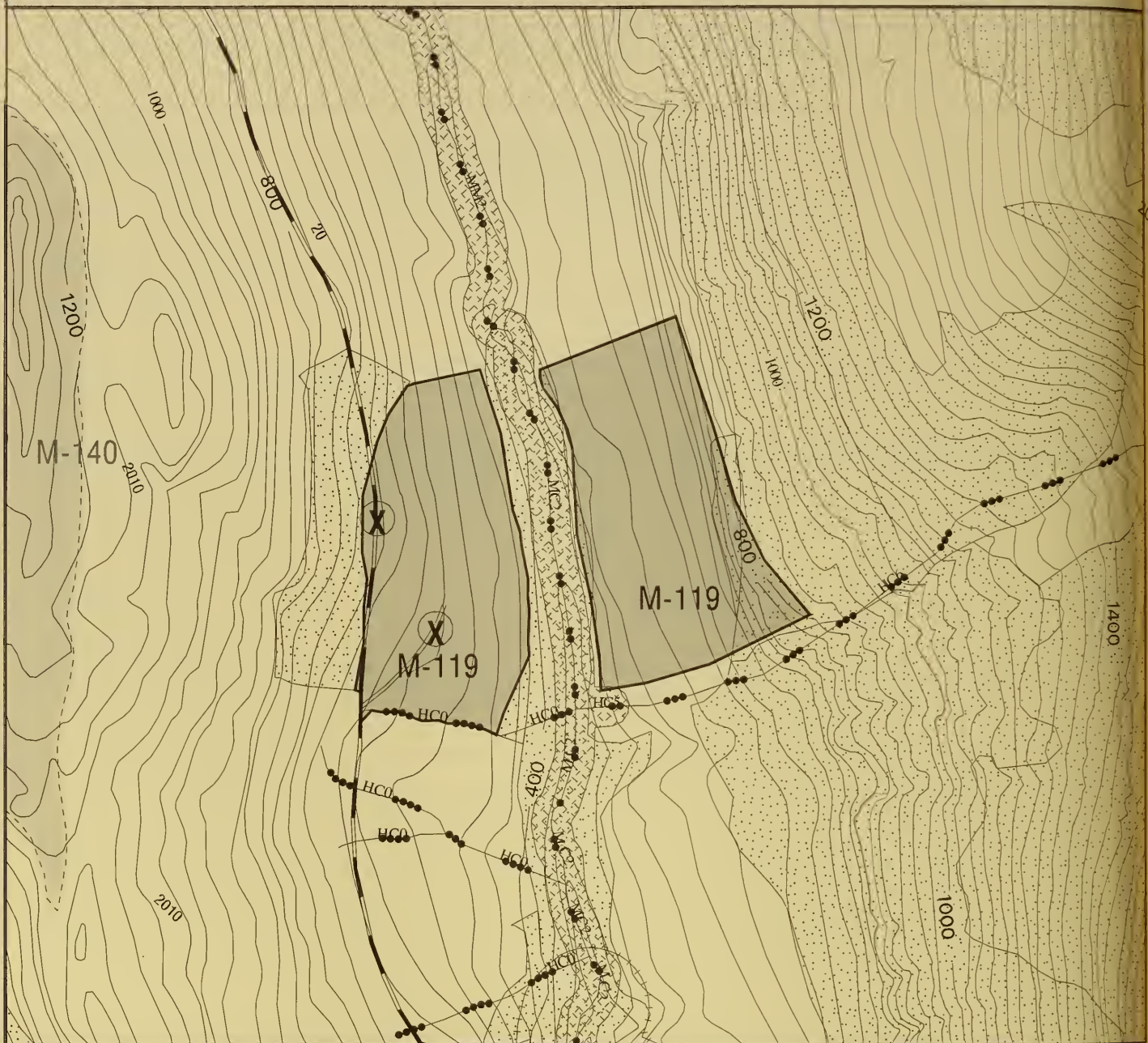
#### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

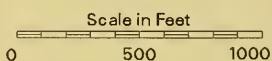
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|---------------|----------------------|--|----------------------------------|--|------------------------------------|
|               | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|               | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|               | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|               | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|               | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|               | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|               | 40' Contours         |  |                                  |  | State/Private Land                 |
| <b>E</b>      | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| HC1, MM3, ... | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft





Harvest Method: SlacklineTotal Acres: 60Total Volume: 1,003 MBFVolume per Acre: 17 MBF**UNIT DEVELOPMENT**

Unit designed to avoid MMI4 soils in the northwest and southeast corners of the portion of the unit west of Moose Creek. In the northwest corner the road goes through MMI4 soils; therefore need a geologist field review of the road layout for final approval. Two Class IV (orange/white) streams need directional felling. Harvest buffer along Moose Creek is more than 100 feet wide at all points. No field review has been done in that portion of the unit east of Moose Creek. (See Logging and Transportation.) The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F15, F18, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

A post-field-season review of the Moose Creek road system determined that a road on the east side of Moose Creek would not be necessary if the timber on the east side of Moose Creek was yarded west across Moose Creek to the 20 road. As a result, the southern portion (flagged in the field) has been dropped, and acreage has been added east of Moose Creek and is intended to make a logical slackline setting. The timber can be yarded using a large (90') tower with haulback capabilities in a slackline configuration. Field verify anchors, landings, and suspension capability with skyline profiles during final layout. The field engineer states that tailholds will be marginal for the slackline system. Timber is planned to be yarded across the TTRA buffer on Moose Creek (Class II). Small portions of the unit can be shovel yarded. The SE corner (SE of the flagged southern setting) of the western portion of unit was excluded due to steep slopes and MMI4 soils (BMP 13.5). The NW portion of this portion of unit was also deleted because of MMI4 soils (BMP 13.5). Two Class IV streams mid-unit require directional felling and split yarding. Recommend split yarding and directional felling around southern muskeg and pond. The north boundary may have potential for windthrow after harvest (BMP 12.6(a), 13.16).

**Specified Roads:** The unit is accessed by the 20 road.

**Temporary Roads:** One spur about 1000' long. Other short spurs may be necessary.

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 903). Leave scattered and clumped trees along with snags and non-merchantable trees along streams and/or muskeg. Avoid harvest in areas of MMI4 soils. Possibly leave tree islands downslope of muskeg between muskeg and streams and in eastern portion of unit where medium-value deer winter range occurs. Clearcutting with reserve trees is proposed because the unit is not visible from saltwater or other important viewing areas. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.

## RESOURCE CONCERNS & MITIGATION

### **Watershed/Fisheries**

**Concern:** Unit is bisected by Class II Moose Creek (MC2). Plans call for timber from east half of unit to be yarded across Moose Creek. Southeast unit boundary borders Class II/III (HC5/HC6) tributary to Moose Creek. Unit contains Class IV (HC0) tributaries to Moose Creek. Temporary road may provide additional access within west half of unit. Areas along the eastern side of Moose Creek have been characterized as unstable. Care needs to be taken to minimize damage to riparian vegetation when yarding across Moose Creek. Unmapped off-channel/overflow channels have been identified along similar areas of Moose Creek. Verification Updates: Resident fish found in lower reach of Moose Creek tributary at southeast unit boundary.

**Mitigation:** May require directional felling or suspension for Class IV channels. No harvest within 100 feet of Moose Creek or top of v-notch, whichever is greater. Manage beyond (approx. one site-potential tree height) for reasonable assurance of wind firmness. Minimize disturbance to riparian vegetation. Survey mainstem of Moose Creek to identify unmapped channel features within the floodplain. Restore natural drainage patterns during temporary road obliteration. (BMPs 12.6, 12.6a, 13.9, 13.16). Fisheries personnel will assist with final layout.

### **Soils/Wetlands/Karst**

**Concern:** MMI4 soils in northwest and southeast corners of that portion of unit west of Moose Creek. There is a moderate risk of landslides due to timber harvest. There has been no field review on that portion of the unit east of Moose Creek. There are MMI4 soils indicated by GIS mapping and there may be slope stability concerns that are not shown by GIS mapping.

**Mitigation:** On the west side of Moose Creek: northwest and southeast corners of the unit have been dropped due to MMI4 soils. Note, however, that bench below slope would probably prevent significant amounts of sediment from reaching Moose Creek. On the east-side of Moose Creek need geotechnical review during final layout to delineate any areas of instability or karst features so that harvest can be avoided in these areas. Use partial or full suspension in areas of high mass movement potential.

### **Wildlife/TES Plants**

**Concern:** Small portion of southeastern edge of unit is high probability goshawk nesting habitat. Eastern portion consists mostly of medium-value deer winter range and western portion is mostly low value, based on habitat capability modeling.

**Mitigation:** Leave trees in the unit along streams and/or muskeg to provide travel corridors. Emphasize leave trees in eastern portion where higher value winter range occurs.

### **Visual/Recreation**

**Concern:** Not seen from saltwater or important viewing areas.

**Mitigation:** None needed.

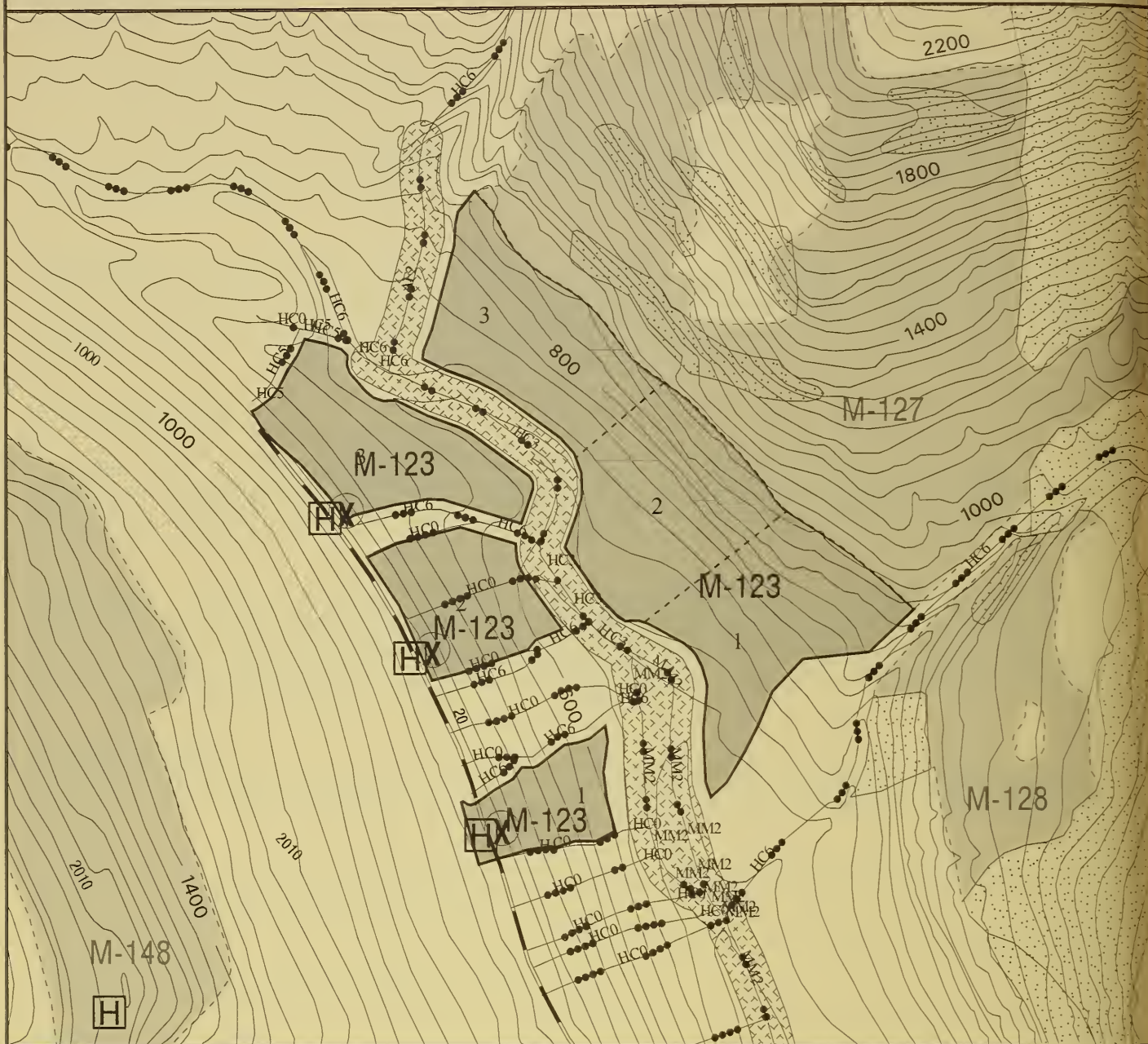
### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- Proposed LTF Sites
- Channel Types

- Potential Helicopter Landings
- Other Landings
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- Second Growth
- Sort Yards

- Eagle Nest Tree
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- Adjacent proposed units
- TTRA Buffers
- 1/4 Mile Eagle Nest Timing Buffers
- Setting
- State/Private Land
- Lakes

Scale: 1" = 800 ft

Scale in Feet

Harvest Method: Slackline/HelicopterTotal Acres: 83Total Volume: 2,950 MBFVolume per Acre: 35 MBF**UNIT DEVELOPMENT**

Unit designed to avoid harvest on steep slopes and unstable v-notches of the numerous streams. Upper slope (above road) in southwest and northwest corners dropped during boundary layout due to logging limitations. Unit boundary along southern portion of Moose Creek needs to be moved up-slope to buffer Class II side channel of Moose Creek. Class III stream at northern boundary needs slope break buffer. No field review has been done on that portion of the unit east of Moose Creek. Helicopter logging may be necessary for this area. (See Logging and Transportation). The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F18, T1, W1, and V1. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

A post-field-season review of the Moose Creek road system determined that a road on the east side of Moose Creek would not be necessary if the timber on the east side of Moose Creek was yarded west across Moose Creek to the 20 road. As a result, acreage has been added east of Moose Creek and is intended to make a logical slackline setting. The timber can be yarded using a large (90') tower with haulback capabilities in a slackline configuration. Field verify anchors, landings, and suspension capability with skyline profiles during final layout. The field engineer states that tailholds will be marginal for the slackline system. Timber is planned to be yarded across the TTRA buffer on Moose Creek (Class II). A Class II side channel west of and parallel to Moose Creek will also need a 100' buffer (BMP 12.6(a), 13.16) (final layout). Several Class III & IV streams (V-notches) requiring protection are present in the unit; and the unit settings were selected to avoid logging in the areas with concentrations of streams. Each setting boundary will have streams as north and south boundaries and directional felling will be required. The western boundary was placed at a slope break. Windthrow is not expected to be a problem after harvest. This unit has good quality timber. Helicopter logging may be necessary and should be considered for the area east of Moose Creek.

**Specified Roads:** The unit is accessed by the 20 road. Look at moving the road 100-200' west during final layout to avoid "V"-notch crossings which will be difficult to construct. Consider oversize culverts to pass bedload.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

**Silvicultural Prescription:** Clearcut with Reserve Trees (estimated harvest volume = 2,654 MBF). Leave retention blocks of trees in-between streams too close together to allow directional falling. In the area east of Moose Creek, leave two forested travel corridors running along the slope. Clearcutting with reserve trees is proposed because the unit is not visible from saltwater or other important viewing areas. This prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and would be the most economical harvest method. This prescription is appropriate also to meet wildlife, watershed, and other resource objectives. Regeneration harvest (clearcut with reserve trees) in approximately 100 years. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning.



## RESOURCE CONCERNS & MITIGATION

### **Watershed/Fisheries**

**Concern:** Unit is bisected by Class II Moose Creek (MM2) in vicinity of large side channel. Plans call for timber from east half of unit to be yarded across Moose Creek. Unit contains Class III (HC6) and Class IV (HC0) tributaries to Moose Creek. Many areas along the eastern side of Moose Creek have been characterized as unstable. Yarding across Class II stream may result in damage to riparian vegetation. Unmapped off channel/over flow channels have been identified along similar areas of Moose Creek.

**Mitigation:** Unit provides 120-foot (TTRA) no-harvest buffer along outermost Moose Creek channels. Designate yarding corridors across Moose Creek and ensure full suspension will be provided across Class II stream. No harvest on sideslope adjacent to Class III streams. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required. (BMPs 12.6, 12.6a, 13.9, 13.16). Fisheries personnel will assist with final layout

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### **Soils/Wetlands/Karst**

**Concern:** Numerous streams in or adjacent to unit; steep slopes, evidence of significant bedload movement in channels, soil slips possible on side slopes. Road crossing are a concern because of potential for delivery of sediments to Moose Creek.

**Mitigation:** Move road up slope, buffer streams to slope break with windfirm partial cut. Oversize culverts to pass bedload. Geologist/hydrologist will carefully review stream crossings at final layout.

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### **Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal problems. Potential fragmentation of corridor between Moose Creek and the lowest pass over to Virginia Lake. Contains much of the medium-value deer winter range (particularly in the western portion of unit) at the upper end of the Moose Creek valley. Potential use by wintering mountain goats.

**Mitigation:** Two forested travel corridors will be left in the eastern portion of the unit running along the slope. Leave trees in the unit along streams and/or muskeg in other areas to provide travel corridors.

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### **Visual/Recreation**

**Concern:** Not seen from saltwater or important viewing areas.

**Mitigation:** None needed.

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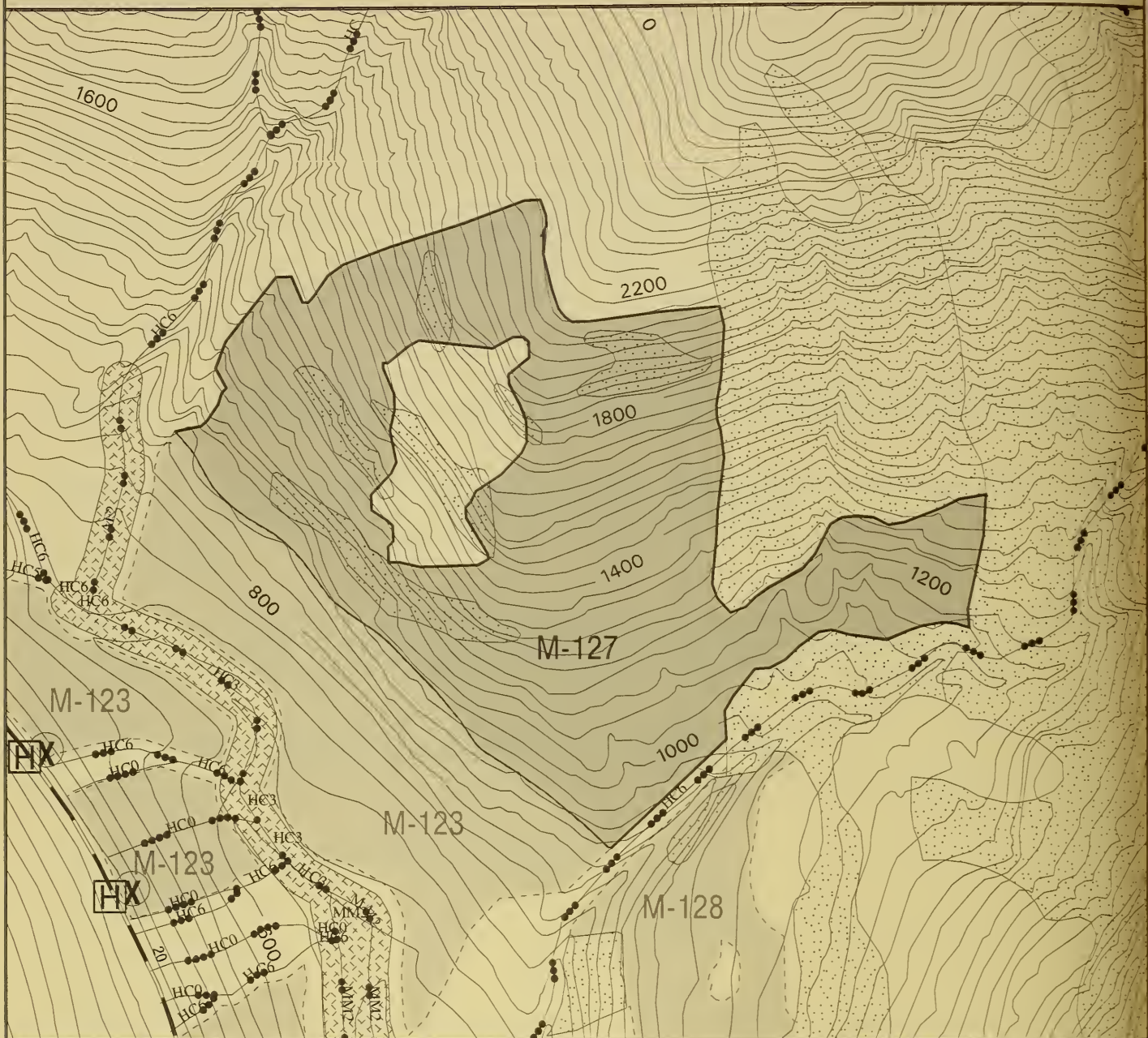
### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None



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- |  |                      |  |                                  |  |                                    |
|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  |                                  |  | Setting                            |
|  | 40' Contours         |  | Sort Yards                       |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft

Scale in Feet

Harvest Method: HelicopterTotal Acres: 125 Total Volume: 3,953 MBFVolume per Acre: 32 MBF**UNIT DEVELOPMENT**

Upper boundary dropped to 2,100 feet elevation due to dominance of mountain hemlock, steep slopes, mountain goat winter habitat, and economics. There is a potential for windthrow on the eastern half of the unit. There is a potential for slope instability and windthrow. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F15, F18, T1, W5, W8, and V5. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a helicopter and flown to the landings in M-123. Move north boundary down to 2,000' elevation because of wildlife and unsuitable timber. Place a 100' buffer on the SE Class III to prevent windthrow (BMP 12.6(a), 13.16). The unit has visual concerns in the upper elevations. The timber in the unit varies from old and rotten in the west to better quality in the east.

**Specified Roads:** None. The closest road is the 20 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small patches of even-aged stands, surrounded by larger patches of old growth.

**Silvicultural Prescription:** Patch Cuts with Minimum 60% Retention (estimated harvest volume = 1,186 MBF). Small clearcuts up to 5 acres, scattered throughout the unit. Approximately 30% of the basal area would be removed in each entry, with 30 to 40 years between entries. 10% of the basal area would be retained as permanent reserve trees throughout the rotation. Avoid placement of patch cuts at upper boundaries to maintain timber edge and avoid placement of patches in areas with unstable slopes. Leave more trees in the northeastern 1/3 of unit, which can be seen from saltwater. Vary edges and backline. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest approximately 30% of the stand every 30 to 50 years by harvesting small areas up to 5 acres in size, scattered through the unit. Future entries will maintain a minimum of 60% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest primarily second growth trees. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning as well as future entries similar to this patch cut harvest in 30 to 50 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Class III (HC6) tributaries to Moose Creek adjacent to north and south unit boundaries. Windthrow may be problem in eastern (upper slopes of) unit. Unit contains un-mapped Class IV (HC0) tributaries to Moose Creek.

**Mitigation:** No harvest on sideslope adjacent to Class III streams. Sideslope buffers have been extended to improve windfirmness. Helicopter yarding is expected to provide full suspension across Class IV streams, at least partial suspension is required. (BMPs 12.6, 12.6a, 13.9, 13.16).



### **Soils/Wetlands/Karst**

**Concern:** There are some very steep portions of this unit, with subsurface drainage from avalanche slopes above.

**Mitigation:** Patch cuts must avoid the steepest, unstable portions of this unit. Use suspension in areas of high mass movement potential. Upper boundary lowered to avoid some steep slopes.

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### **Wildlife/TES Plants**

**Concern:** Mountain goat winter range. Connection between large forested blocks and Moose Creek. Two historical eagle nest sites occur near Moose Creek LTF, therefore, use of helicopter traveling to and from the Moose Creek LTF could disturb nesting eagles.

**Mitigation:** Select harvest patches away from the higher elevations to maintain adequate forest cover along the non-forested alpine areas. Survey for mountain goat trails and important winter range during final layout. Prioritize forested patches for travel corridors and important winter range. Use designated flight path and avoid repeated helicopter flights within ¼ mile of all nests from March 1 through May 31. Survey needed prior to harvest to verify eagle nest activity. If nests are active, continue to avoid repeated helicopter flights through August 31.

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### **Visual/Recreation**

**Concern:** The Visual Quality Objective is modification and maximum modification. The northeastern 1/3 the main portion of the unit can be seen from saltwater. Do not want a straight, “unnatural” edge for this portion of the unit boundary.

**Mitigation:** For the eastern edge of the main portion of unit that can be seen from saltwater, vary edges and backline to give this part of unit more natural shape. Do not use straight edges for this part of unit.

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### **Other Resources/Issues**

**Concern:** None

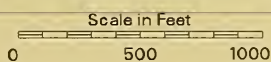
**Mitigation:** None

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- |               |                      |  |                                  |  |                                    |
|---------------|----------------------|--|----------------------------------|--|------------------------------------|
|               | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|               | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|               | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|               | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|               | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|               | Class 4 Streams      |  | Sort Yards                       |  | Setting                            |
|               | 40' Contours         |  |                                  |  | State/Private Land                 |
| <b>E</b>      | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| HC1, MM3, ... | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft





Harvest Method: HelicopterTotal Acres: 24 Total Volume: 718 MBFVolume per Acre: 29 MBF**UNIT DEVELOPMENT**

Unit boundaries have been altered by dropping the long narrow "finger" to the south due to feasibility and the western edge was modified due to steep unstable slopes. A forested muskeg exists in the mid-eastern portion of the unit. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F11, F15, F18, T1, W5, W8, and V5. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded by helicopter to the landing in setting 1 of M-123. The northern boundary is along a class III stream with steep banks (BMP 13.16); place the boundary on the slope break. The east boundary shall be the edge of merchantable timber. The western boundary should be the limit of cable system capability. The timber is good to excellent quality. Blowdown was found near the north boundary and windthrow may be a problem in that area after harvest; very little blowdown was observed elsewhere in unit.

**Specified Roads:** The timber can be flown to the 20 road.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small patches of even-aged stands surrounded by larger patches of old growth.

**Silvicultural Prescription:** Patch Cuts with Minimum 60% Retention (estimated harvest volume = 215 MBF). Small clearcuts up to 5 acres, scattered throughout the unit. Approximately 30% of the basal area would be removed in each entry, with 30 to 40 years between entries. 10% of the basal area would be retained as permanent reserve trees throughout the rotation. Avoid placement of patch cuts at upper boundaries to maintain timber edge and avoid placement of patches in areas with unstable slopes. Avoid placement of patches in areas of forested muskeg (see map). This prescription would address visual and wildlife resource concerns. Harvest approximately 30% of the stand every 30 to 50 years by harvesting small areas up to 5 acres in size, scattered through the unit. Future entries will maintain a minimum of 60% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest primarily second growth trees. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning as well as future entries similar to this patch cut harvest in 30 to 50 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Class III (HC6) tributary to Moose Creek adjacent to north unit boundary. Windthrow may be a problem. Unit may contain un-mapped Class IV (HC0) tributaries to Moose Creek.

**Mitigation:** No harvest on sideslope adjacent to Class III stream. Sideslope buffers have been extended to improve windfirmness. Helicopter yarding is expected to provide full suspension across Class IV streams, at least partial suspension is required. (BMPs 12.6, 12.6a, 13.9, 13.16).

### **Soils/Wetlands/Karst**

**Concern:** There is an area in the mid-eastern portion of the unit with a forested muskeg with small inclusions of organic soils (no mineral component). Poor quality timber occurs in this area. An area of MMI4 soils occurs in the western portion of the unit.

**Mitigation:** Areas of forested muskeg and unstable steep slopes have been dropped from the unit. Use suspension in areas of high mass movement potential.

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### **Wildlife/TES Plants**

**Concern:** Two historical eagle nest sites occur near Moose Creek LTF, therefore, use of helicopter traveling to and from the Moose Creek LTF could disturb nesting eagles.

**Mitigation:** Avoid repeated helicopter flights within ¼ mile of all nests from March 1 through May 31. Survey needed prior to harvest to verify eagle nest activity. If nests are active, continue to avoid repeated helicopter flights through August 31.

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### **Visual/Recreation**

**Concern:** Not seen from saltwater.

**Mitigation:** None needed.

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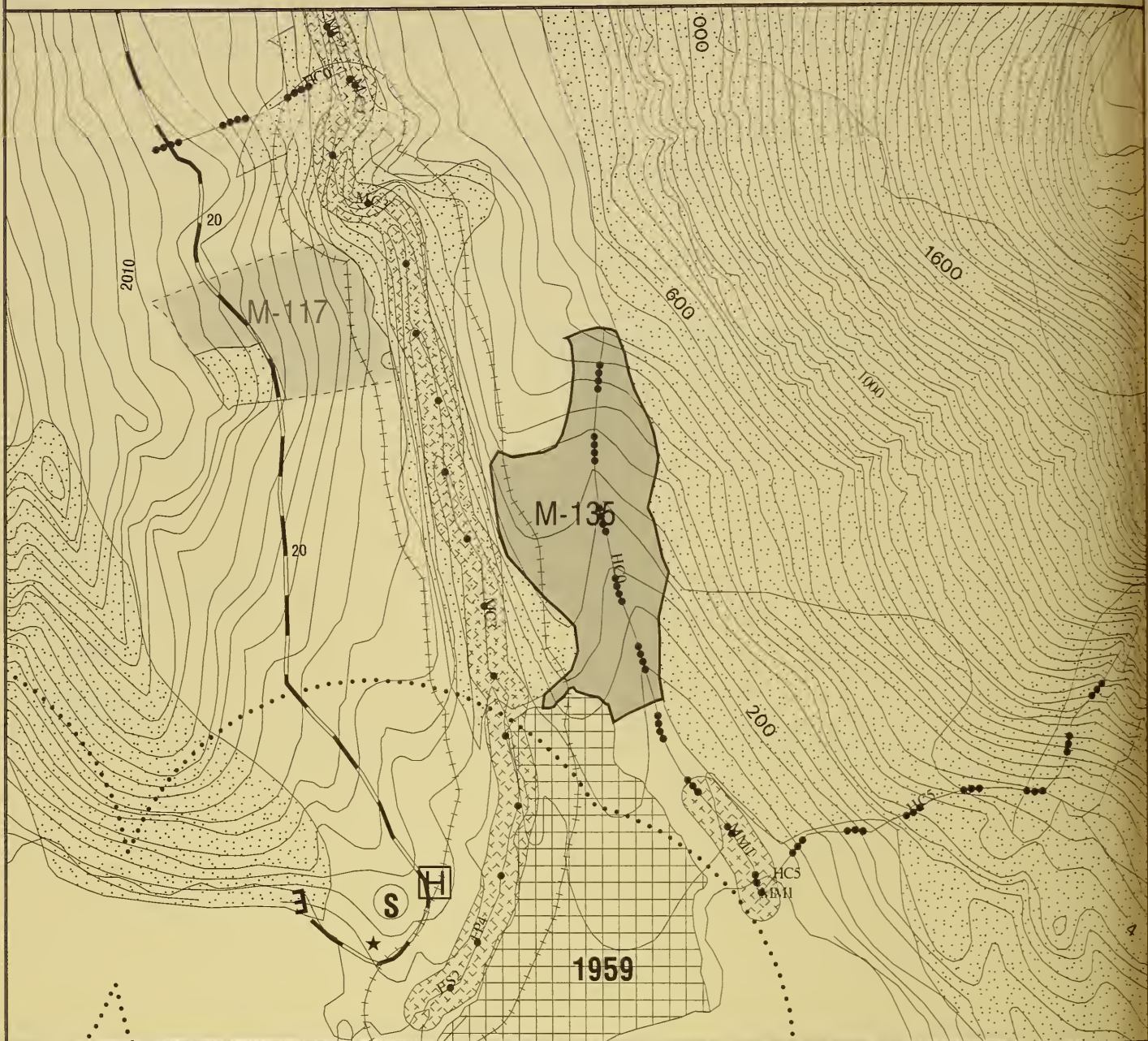
### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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- |               |                      |  |                                  |  |                                    |
|---------------|----------------------|--|----------------------------------|--|------------------------------------|
|               | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|               | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|               | Class 1 Streams      |  | Very High Hazard Soils (MMI4)    |  | Adjacent proposed units            |
|               | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|               | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|               | Class 4 Streams      |  |                                  |  | Setting                            |
|               | 40' Contours         |  | Sort Yards                       |  | State/Private Land                 |
| <b>E</b>      | Proposed LTF Sites   |  |                                  |  | Lakes                              |
| HC1, MM3, ... | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft



Harvest Method: HelicopterTotal Acres: 24Total Volume: 615 MBFVolume per Acre: 26 MBF**UNIT DEVELOPMENT**

Unit designed to avoid steep slopes and slide areas. Those areas need geotechnical review during final layout to refine boundary and either drop additional areas or selective single tree or group selection in these areas. A Class IV stream in the unit becomes a Class II outside the unit so the stream needs a slope break buffer in the unit. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F15, T1, W6, W7, W8, V6, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded by helicopter directly to the Moose Creek LTF. The boundary is intended to be around a timber type. There are several creeks and one slide with alder regeneration in the unit (BMP 13.5). The unit has visual concerns from Blake Channel to the south. See Visual/Recreation section.

**Specified Roads:** The timber can be flown directly to the Moose Creek LTF.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Group Selection (estimated harvest volume = 154 MBF). In 2-acre group cuts. Make group cuts along contours to minimize visual impacts; see Visual/Recreation section. Harvest only in areas away from steep slopes (see Soils section). Also, avoid harvest along any wildlife trails paralleling Moose Creek in lower part of unit (see Wildlife section). Leave non-merchantable timber in wetter areas and on steep slopes. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size). Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** West unit boundary near Class I Moose Creek (MC3). Unit contains Class IV (HC0) stream tributary to Class II stream flowing into Eastern Passage.

**Mitigation:** Unit boundary excludes sideslope adjacent to Class I stream, providing at least 100-foot (TTRA) no-harvest buffer. Helicopter yarding is expected to provide full suspension across Class IV stream, at least partial suspension is required. (BMPs 12.6, 12.6a, 13.9, 13.16). Hydrologist or fisheries specialist should assist with final layout to ensure protection of Moose Creek.



### **Soils/Wetlands/Karst**

**Concern:** Unstable soils on steep slopes in the northwest portion of unit. Two slides (1-4 years old) in this area.

**Mitigation:** Unit boundaries have been modified to avoid steep slopes/unstable soils and slide areas. Avoid placement of group cuts adjacent to these areas. Use suspension in areas with high mass movement potential.

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### **Wildlife/TES Plants**

**Concern:** Approximately 2/3 of the unit contains high deer HSI values. Northern half of unit is high probability goshawk nesting habitat. Two historical eagle nest sites occur near Moose Creek LTF, therefore, use of helicopter traveling to and from the Moose Creek LTF could disturb nesting eagles. Concern over use of lower part of unit as travel corridor, because of proximity to Moose Creek,

**Mitigation:** Group selection will maintain some level of forest stand structure within the unit. Avoid repeated helicopter flights within ¼ mile of all nests from March 1 through May 31. Survey needed prior to harvest to verify eagle nest activity. If nests are active, continue to avoid repeated helicopter flights through August 31. During final layout, search for wildlife trails through lower portion of unit above Moose Creek. If trails are found, maintain forest cover along them.

---

### **Visual/Recreation**

**Concern:** Meet Visual Quality Objective of partial retention in area (north 1/4 [upper slope] part of unit) seen from saltwater. From saltwater, the group selections will be small and barely noticeable, but should still have natural (uneven) shapes and should appear to be natural openings.

**Mitigation:** Group selection will consist of 2-acre patch cuts. Lay the patch cuts out along contours to minimize visual impacts. Approximately 10% of basal area is to be retained as reserve trees. Make sure the patch cuts are uneven in shape and randomly spaced within the unit to create a more natural pattern of small openings.

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### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None



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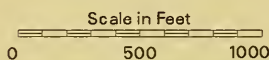


- Proposed Spec. Roads
- Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- E** Proposed LTF Sites
- HC1, MM3, ... Channel Types

- Potential Helicopter Landings
- Other Landings
- Very High Hazard Soils (MMI4)
- 300' Offset From Class 1 Streams
- Second Growth
- Sort Yards

- Eagle Nest Tree
- Proposed cut units
- Adjacent proposed units
- TTRA Buffers
- 1/4 Mile Eagle Nest Timing Buffers
- Setting
- State/Private Land
- Lakes

Scale: 1" = 800 ft



Harvest Method: HelicopterTotal Acres: 43Total Volume: 1,096 MBFVolume per Acre: 25 MBF**UNIT DEVELOPMENT**

The western portion of the unit has been dropped due to slope instability. The road into the unit was changed to enter the unit in the mid-section and then "t" to reach both ends of the unit. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F15, K3, T1, W6, and V6. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration using the road as a continuous road-side landing. Deflection is adequate for the east side. The west boundary was placed at a slope break above class III stream where hanging across the class III stream would be required due to the convex slopes; the IDT decision is to move the western boundary east up to the topographic limit of a mobile yarder. Portions of the unit can be shovel yarded. However, it was decided to not build the road and use helicopter yarding. Helicopter volume will be yarded to landings along Road 20.

**Specified Roads:** The unit was originally accessed by temporary spurs off of the 2010 road. However, the 2010 road and spurs will not be built in the selected alternative. Volume will be yarded to landings along Road 20.

**Temporary Roads:** There was 3,800 feet of temporary road originally planned in the unit. However, this temporary road will not be built in the selected alternative.

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 274 MBF). Harvest individual trees and/or groups of trees, scattered throughout the unit. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Steep side slope along Class III stream may result in slope failure.

**Mitigation:** Move unit boundary upslope to avoid steep side slope. No programmed harvest within v-notch. Maintain windfirmness beyond.

**Soils/Wetlands/Karst**

**Concern:** Lower part of west side of unit greater than 90% slope with numerous seeps and possible debris avalanche scars. These are above a class III stream.

**Mitigation:** This area has been excluded from unit (see map).



**Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal problems.

**Mitigation:** Scatter reserve trees throughout unit to allow dispersal.

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**Visual/Recreation**

**Concern:** Not seen from saltwater or important viewing locations.

**Mitigation:** No mitigation needed.

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**Other Resources/Issues**

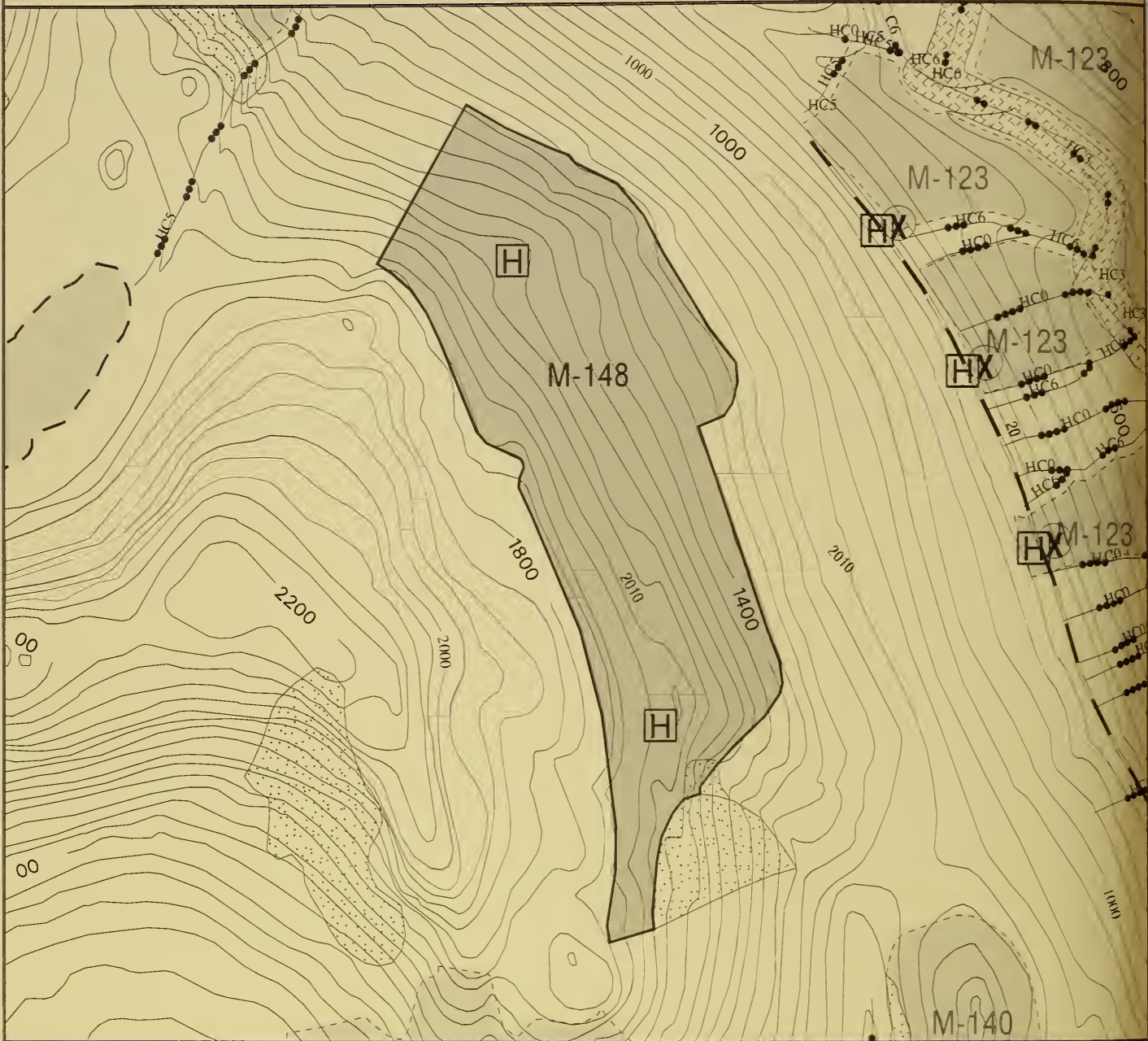
**Concern:** None

**Mitigation:** None

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# UNIT M-148

83 ACRES



- |  |                      |  |                                  |  |                                    |
|--|----------------------|--|----------------------------------|--|------------------------------------|
|  | Proposed Spec. Roads |  | Potential Helicopter Landings    |  | Eagle Nest Tree                    |
|  | Proposed Temp. Roads |  | Other Landings                   |  | Proposed cut units                 |
|  | Class 1 Streams      |  | Very High Hazard Soils (MM14)    |  | Adjacent proposed units            |
|  | Class 2 Streams      |  | 300' Offset From Class 1 Streams |  | TTRA Buffers                       |
|  | Class 3 Streams      |  | Second Growth                    |  | 1/4 Mile Eagle Nest Timing Buffers |
|  | Class 4 Streams      |  |                                  |  | Setting                            |
|  | 40' Contours         |  | Sort Yards                       |  | State/Private Land                 |
|  | Proposed LTF Sites   |  |                                  |  | Lakes                              |
|  | Channel Types        |  |                                  |  |                                    |

Scale: 1" = 800 ft

Scale in Feet

0 500 1000



Harvest Method: HelicopterTotal Acres: 83Total Volume: 2,683 MBFVolume per Acre: 32 MBF**UNIT DEVELOPMENT**

Unit has been expanded on the northern end and reduced in the southern portion due to MMI4 soils and logging constraints. Expanded area has not had field review for other resource concerns. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F11, F15, T1, W1, W7, V1, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be yarded using a small mobile yarder in a running skyline configuration using the road as a continuous road-side landing. Deflection is adequate. Tailholds are adequate. However, it was decided to not build the road and use helicopter yarding in the selected alternative. Helicopter volume will be yarded to landings along Road 20. The western boundary could be expanded west. The SE portion of the unit was deleted due to MMI4 soils (BMP 13.5). Most of the SE boundary follows a slope break of the MMI4 soils. The south tip may be partially visible from Blake Channel to the south.

**Specified Roads:** The unit was accessed by the 2010 road. However, this road will not be built in the selected alternative. Volume will be yarded to landings along Road 20.

**Temporary Roads:** There will be no need for spurs in the selected alternative.

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Individual/Group Selection with a minimum 70% retention (estimated harvest volume = 671 MBF). Harvest individual trees and/or groups of trees, scattered throughout the unit. This prescription would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size) and/or individual trees. Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second-growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** MMI4 soils in lower portion of unit. No significant stream channels observed within unit.

**Mitigation:** This area of MMI4 soils has been dropped from unit.

**Soils/Wetlands/Karst**

**Concern:** Small patch of MMI4 in southern 1/5 of unit. Several springs present where till is present.

**Mitigation:** This area of MMI4 soils has been dropped from unit.

**Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal problems.

**Mitigation:** Scatter reserve trees throughout unit to allow dispersal.

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**Visual/Recreation**

**Concern:** Not seen from saltwater or important viewing locations.

**Mitigation:** None needed.

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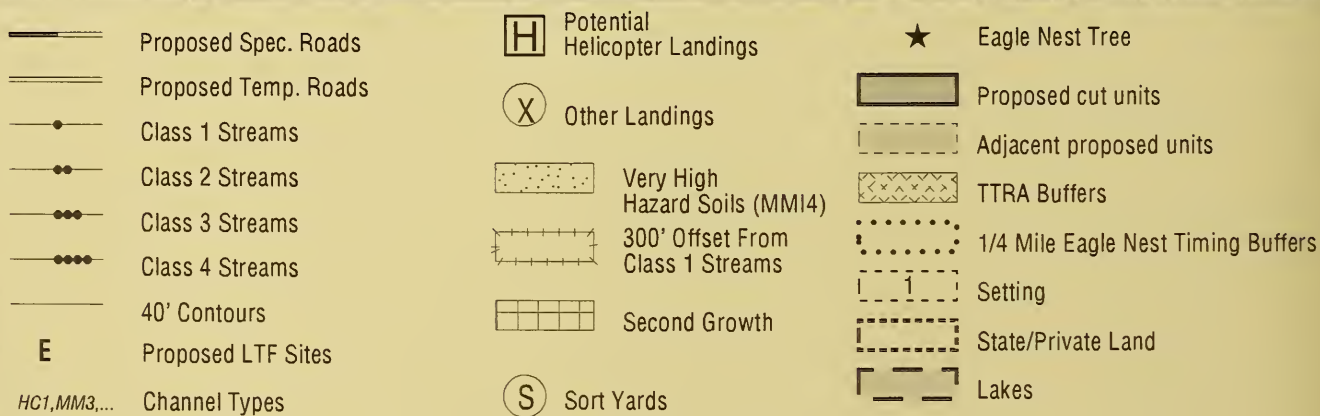
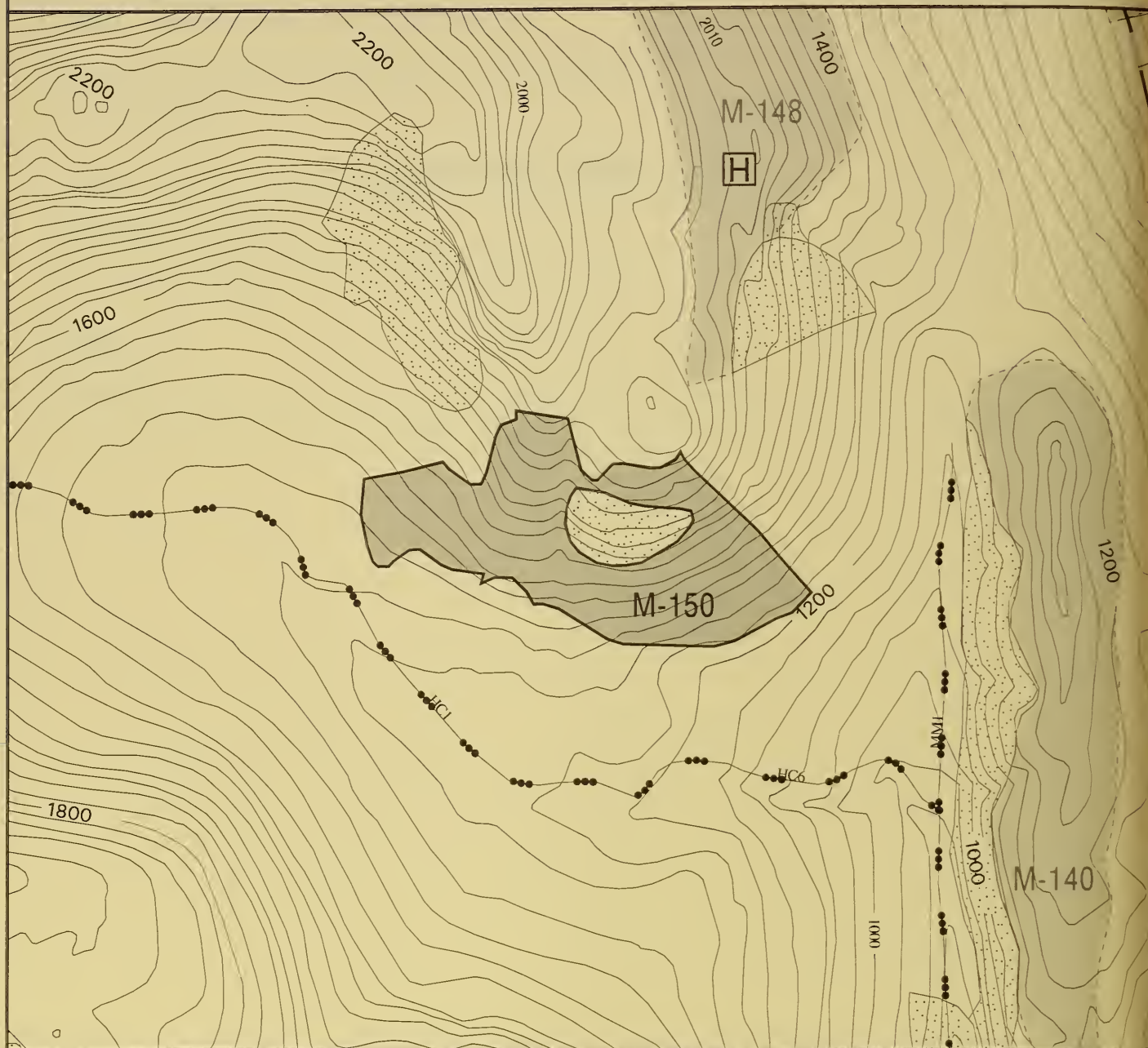
**Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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Scale: 1" = 800 ft



## MADAN TIMBER SALE - UNIT CARD

Unit Number M-150 Selected Alternative

Harvest Method: Helicopter

Total Acres: 30 Total Volume: 808 MBF

Volume per Acre: 27 MBF

### UNIT DEVELOPMENT

Unit was originally designed for cable harvest and the boundaries were modified (and flagged) in the field due to steep slopes and MMI4 soils. The logging system was changed to helicopter and therefore, the boundaries should be those originally mapped and not those flagged in the field. The MMI4 area has been dropped from the unit. Unit is within the scenic viewshed. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F15, F18, T1, W6, W7, V6, and V7. These measures are described below within the resource sections that apply.

#### **Logging and Transportation:**

The timber could have been yarded by helicopter to M-148. However, with the change of M-148 to helicopter yarding, helicopter volume from unit M-150 will be yarded to landings along Road 20. Road access and cable logging was dropped due to road construction cost, visuals, inadequate suspension, inadequate guy anchors. The flagged boundary is located at the limit of cable logging; expand boundary to the original unit boundary, but exclude poor soils in the north-central unit (BMP 13.5). Blowdown was found and windthrow may be a problem in the area after harvest. The entire unit has visual concerns.

**Specified Roads:** The timber can be flown to landings along Road 20.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small areas with different cohorts, including remnant old growth, resulting in an uneven-aged stand.

**Silvicultural Prescription:** Group Selection with a minimum 70% retention (estimated harvest volume = 202 MBF). Harvest groups up to 2 acres scattered throughout the unit. Leave scattered leave trees, snags, and non-merchantable trees within 50 – 100 feet of the unit/setting boundaries. Avoid harvest of trees with cavities; see Wildlife concerns. This prescription would address visual and wildlife resource concerns. However, it would not provide conditions suitable for regenerating spruce and would be a less cost-effective method of harvesting trees. Harvest 25 to 30% of the stand every 40 to 60 years by harvesting groups of trees (up to 2 acres in size). Future entries will maintain a minimum of 70% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest a mix of second growth trees and old growth. Thereafter, primarily second growth trees will be harvested. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be mostly hemlock.

**Possible Future Treatments:** Future entries similar to this harvest in 40 to 60 years.

### RESOURCE CONCERNS & MITIGATION

#### **Watershed/Fisheries**

**Concern:** MMI4 soils reported found within unit. Unit is located a long distance from significant stream channels. No fisheries concerns.

**Mitigation:** This area of MMI4 soils has been dropped from unit.

#### **Soils/Wetlands/Karst**

**Concern:** Small patch of MMI4 at top of unit. No karst concerns.

**Mitigation:** Fisheries impacts unlikely, as there is a large muskeg below. However, for regeneration concerns, MMI4 soils has been dropped. Use suspension on areas with high mass movement potential.

**Wildlife/TES Plants**

**Concern:** There is a high diversity of bird species due to the proximity of the large muskeg/ponded area below the unit. Also unit provides bear denning habitat.

**Mitigation:** Avoid harvest of trees with cavities, retain 15 ft of the butt log attached to rootwads and retain snags and downed logs.

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**Visual/Recreation**

**Concern:** Meet Visual Quality Objective of modification in areas visible from saltwater. Northern 2/3 of unit is visible from saltwater (upper slope).

**Mitigation:** None needed.

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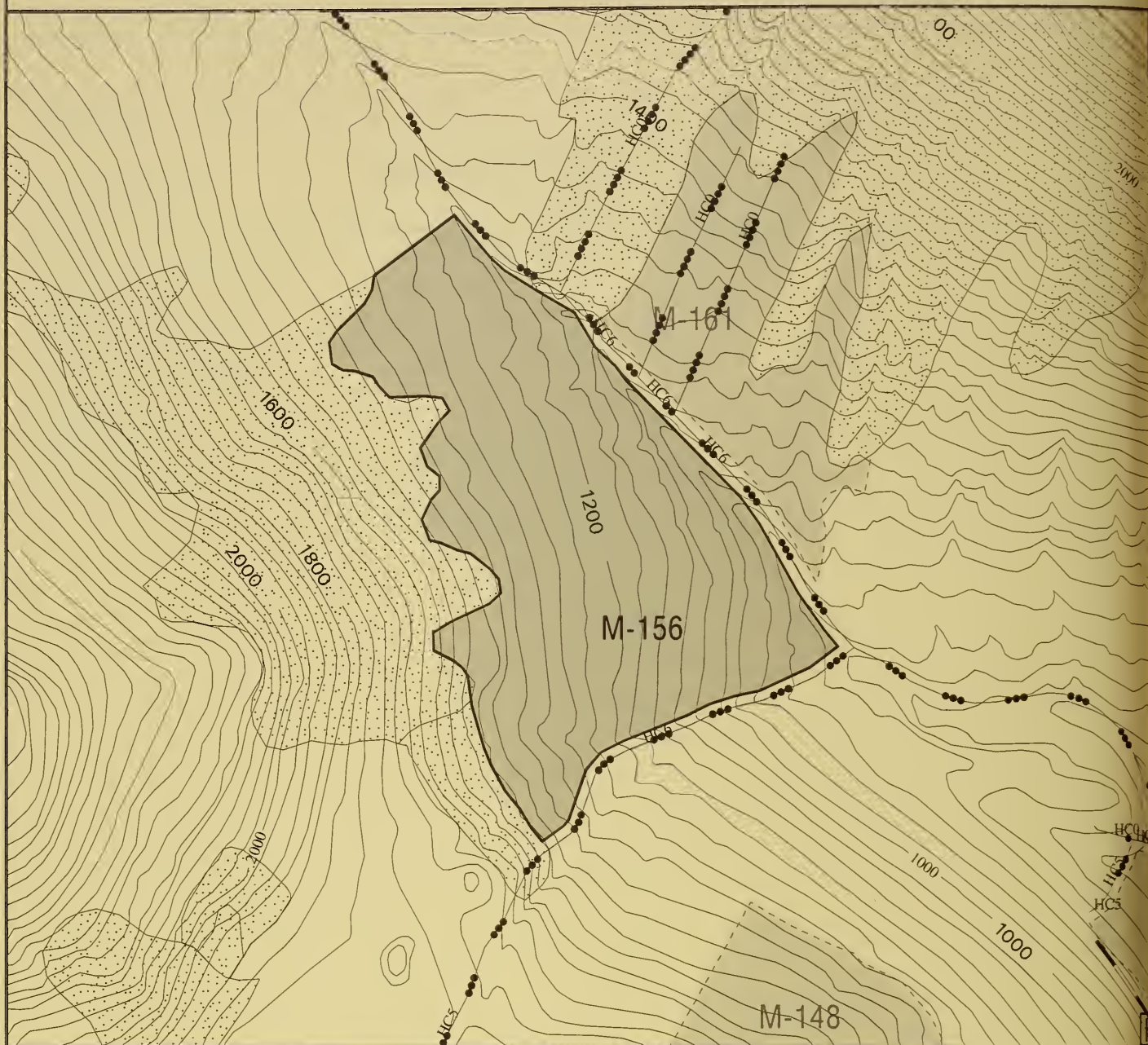
**Other Resources/Issues**

**Concern:** None

**Mitigation:** None

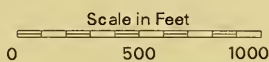


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- |                      |                                  |                                    |
|----------------------|----------------------------------|------------------------------------|
| Proposed Spec. Roads | Potential Helicopter Landings    | Eagle Nest Tree                    |
| Proposed Temp. Roads | Other Landings                   | Proposed cut units                 |
| Class 1 Streams      | Very High Hazard Soils (MMI4)    | Adjacent proposed units            |
| Class 2 Streams      | 300' Offset From Class 1 Streams | TTRA Buffers                       |
| Class 3 Streams      | Second Growth                    | 1/4 Mile Eagle Nest Timing Buffers |
| Class 4 Streams      | Sort Yards                       | Setting                            |
| 40' Contours         |                                  | State/Private Land                 |
| Proposed LTF Sites   |                                  | Lakes                              |
| Channel Types        |                                  |                                    |

Scale: 1" = 800 ft



Harvest Method: HelicopterTotal Acres: 81 Total Volume: 2,702 MBFVolume per Acre: 34 MBF**UNIT DEVELOPMENT**

Drop the southeastern 1/3 of unit at the 1,400 foot elevation (setting boundary) due to slope stability concerns. Edges of unit are prone to avalanches, therefore, must maintain avalanche-firm edges by not harvesting directly to the unit boundaries. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F15, F18, T1, W5, W7, V5, and V7. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be helicopter yarded to M-123. The NE and SE boundaries are along class III streams. The western boundary is the limit of merchantable timber. The NE and southern boundaries were modified to exclude unsuitable timber. Blowdown was found; windthrow may be a problem in that area after harvest.

**Specified Roads:** The timber can be flown to the 1020 road in M-123.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small patches of even-aged stands surrounded by larger patches of old growth.

**Silvicultural Prescription:** Patch Cuts with Minimum 60% retention (estimated harvest volume = 811 MBF). Harvest in patches up to 5-acres, remove approximately 30% of the basal area in each entry with 30 - 40 years between entries. Retain 10% of the basal area as permanent retention throughout the rotation. Avoid placement of patch cuts at the edges of the unit (to maintain avalanche-firm edges) and on steep slopes. Leave non-merchantable timber at edges. This prescription would address visual, watershed, soils and wildlife resource concerns. Harvest approximately 30% of the stand every 30 to 50 years by harvesting small areas up to 5 acres in size, scattered through the unit. Future entries will maintain a minimum of 60% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest primarily second growth trees. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning as well as future entries similar to this patch cut harvest in 30 to 50 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Unit borders Class III (HC6) tributaries to Moose Creek. Unit may contain un-mapped Class IV (HC0) streams.

**Mitigation:** Unit boundary excludes sideslopes adjacent to Class III streams. Helicopter yarding is expected to provide full suspension across Class IV stream, at least partial suspension is required. (BMPs 12.6, 12.6a, 13.9, 13.16).



#### **Soils/Wetlands/Karst**

**Concern:** Old avalanche chutes at the upper edges of the unit. Due to low probability of regeneration in these areas need to maintain trees along these edges.

**Mitigation:** Maintain forested edges along old avalanche areas. Use suspension in areas of high mass movement potential.

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#### **Wildlife/TES Plants**

**Concern:** Size of unit could create dispersal problems and connectivity between Moose Creek and Glacier Creek drainages over the low elevation pass. Two historical eagle nest sites occur near Moose Creek LTF, therefore, use of helicopter traveling to and from the Moose Creek LTF could disturb nesting eagles.

**Mitigation:** Patch Cuts will help provide connectivity between major drainages as well as retaining areas with stand structure for wildlife. Use designated flight path and avoid repeated helicopter flights within ¼ mile of all nests from March 1 through May 31. Survey needed prior to harvest to verify eagle nest activity. If nests are active, continue to avoid repeated helicopter flights though August 31.

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#### **Visual/Recreation**

**Concern:** Not seen from saltwater or important viewing locations.

**Mitigation:** No mitigation needed.

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#### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

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- Proposed Spec. Roads
- - - Proposed Temp. Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Class 4 Streams
- 40' Contours
- E Proposed LTF Sites
- HC1, MM3, ... Channel Types

[H] Potential Helicopter Landings

[X] Other Landings

[Dotted Pattern] Very High Hazard Soils (MM14)

[Dashed Line with Cross-Ticks] 300' Offset From Class 1 Streams

[Grid Pattern] Second Growth

[S] Sort Yards

★ Eagle Nest Tree

[Solid Black] Proposed cut units

[Dashed Black] Adjacent proposed units

[Cross-Hatch Pattern] TTRA Buffers

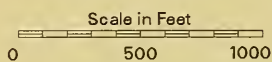
[Dotted Black] 1/4 Mile Eagle Nest Timing Buffers

[Dashed Black with '1'] Setting

[Dashed Black] State/Private Land

[Blue Hatched Pattern] Lakes

Scale: 1" = 800 ft





Harvest Method: HelicopterTotal Acres: 34Total Volume: 1,347 MBFVolume per Acre: 40 MBF**UNIT DEVELOPMENT**

Unit is as designed on unit card. Upper edges of unit are prone to avalanches therefore must maintain avalanche-firm edges by not harvesting directly to the unit boundaries or next to old avalanche chutes. Wet areas along Moose Creek should be avoided when placing harvest patches. The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F1, F2, F3, F4, F11, F15, F18, T1, W5, and V5. These measures are described below within the resource sections that apply.

**Logging and Transportation:**

The timber can be helicopter yarded to M-123. The SW boundary is along a Class III stream.

**Specified Roads:** The can be flown to the 20 road in M-123.

**Temporary Roads:** None

**Stand Management Objectives:** Future stand will be a mosaic of small patches of even-aged stands surrounded by larger patches of old growth.

**Silvicultural Prescription:** Patch Cuts with Minimum 60% retention (estimated harvest volume = 404 MBF). Harvest in patches up to 5-acres, remove approximately 30% of the basal area in each entry with 30 - 40 years between entries. Retain 10% of the basal area as permanent retention throughout the rotation. Avoid placement of patch cuts at the edges of the unit (to maintain avalanche-firm edges) and on steep slopes. Avoid placement of patches in wet areas above Moose Creek. This prescription would address visual and wildlife resource concerns. Harvest approximately 30% of the stand every 30 to 50 years by harvesting small areas up to 5 acres in size, scattered through the unit. Future entries will maintain a minimum of 60% of the stand in mature trees (10% of which will be retention trees). It is expected that the third entry will harvest primarily second growth trees. Leave old growth trees retained in original harvest plus enough large second growth trees to meet the 10% reserve tree requirement.

**Regeneration Method:** Natural regeneration. The new stand is likely to be a mixture of species similar to the existing stand.

**Possible Future Treatments:** Possible planting if natural regeneration does not result in a fully stocked stand or to increase species diversity, release, and pre-commercial thinning as well as future entries similar to this patch cut harvest in 30 to 50 years.

**RESOURCE CONCERNS & MITIGATION****Watershed/Fisheries**

**Concern:** Unit borders Class III (HC6) tributaries to Moose Creek. Unit may contain un-mapped Class IV (HC0) streams.

**Mitigation:** Unit boundary excludes sideslopes adjacent to Class III streams. Helicopter yarding is expected to provide full suspension across Class IV stream, at least partial suspension is required. (BMPs 12.6, 12.6a, 13.9,13.16).

**Soils/Wetlands/Karst**

**Concern:** Wetland soils (organic with a mineral component) along southwestern boundary that borders Moose Creek. High water table in this area due to subsurface drainage into Moose Creek from hillslope in upper portion of unit. At northern end of unit, timber harvest may affect muskeg due to slope instability.

**Mitigation:** Avoid placement of harvest patches in the wet areas above Moose Creek. Unit designed to avoid mapped MMI4 areas. Maintain forested edges along old avalanche areas. Use suspension in areas of high mass movement potential.

### **Wildlife/TES Plants**

**Concern:** Mountain goat winter range. Connectivity between Moose Creek and Glacier Creek drainages over the low elevation pass. Two historical eagle nest sites occur near Moose Creek LTF, therefore, use of helicopter traveling to and from the Moose Creek LTF could disturb nesting eagles.

**Mitigation:** Patch Cuts will maintain the forested areas near alpine habitats and provide connectivity between major drainages as well as retaining areas with stand structure for wildlife. Use designated flight path and avoid repeated helicopter flights within ¼ mile of all nests from March 1 through May 31. Survey needed prior to harvest to verify eagle nest activity. If nests are active, continue to avoid repeated helicopter flights through August 31.

### **Visual/Recreation**

**Concern:** Not seen from saltwater or important viewing locations.

**Mitigation:** No mitigation needed.

### **Other Resources/Issues**

**Concern:** None

**Mitigation:** None

# **RECORD OF DECISION**

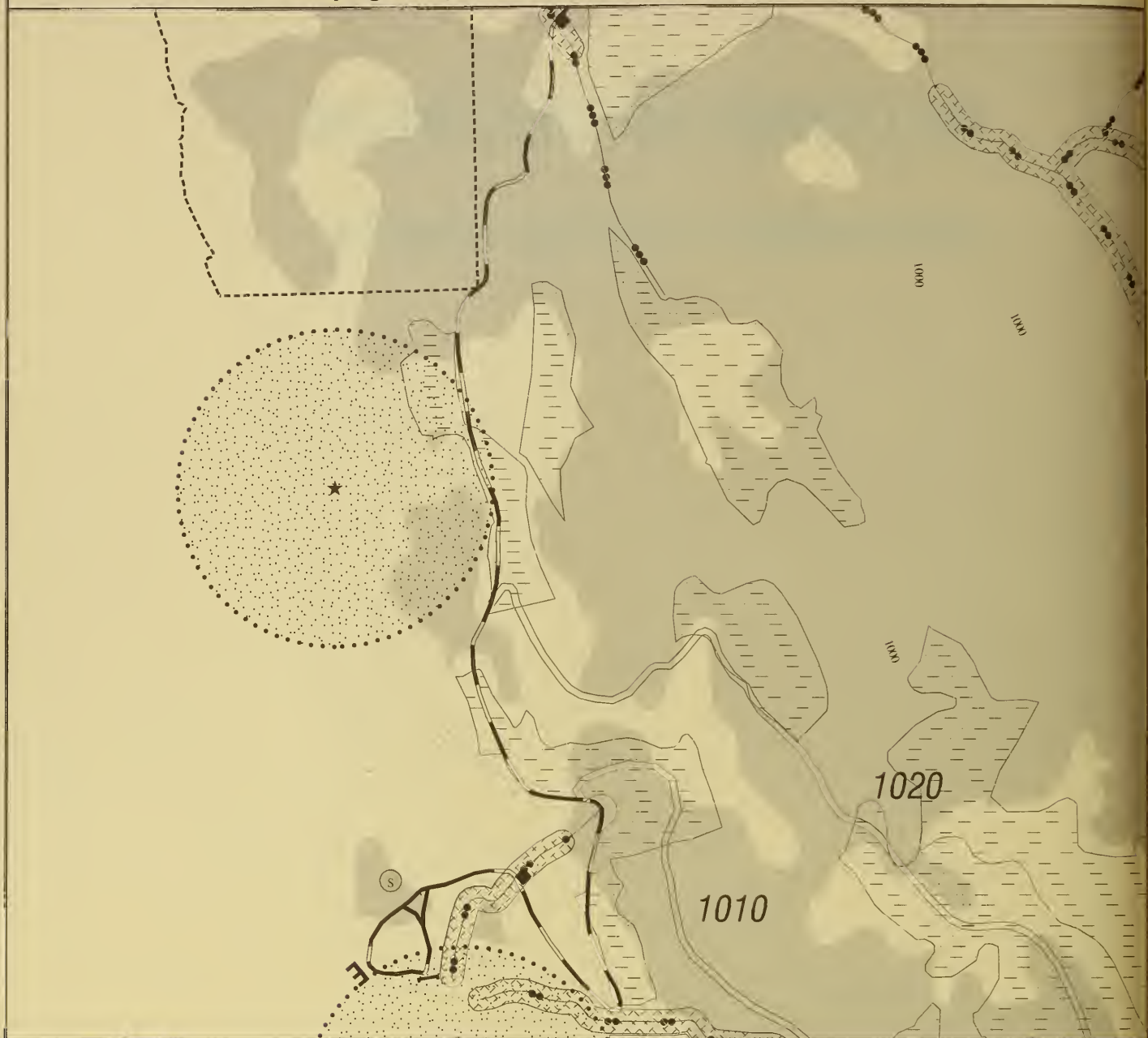
## **APPENDIX 3**





# **RECORD OF DECISION**

## **APPENDIX 3 - ROAD CARDS**

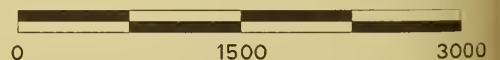


- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Proposed LTF Sites
- Proposed Major Stream Crossing
- Sort Yard

- Eagle Nest Tree
- Proposed cut units
- TTRA Buffers
- Wetlands
- 1/4 mile Eagle Nest Timing Buffer
- State/Private Land

Scale: 4" = 1 Mile

Scale in Feet



Miles





## ROAD MANAGEMENT OBJECTIVES

### Madan Project - Road 10

<u>Road Description/Location</u>				
Project	System			Land Use Designation
Madan	Mainland			TM
Route No	Route Name	Begin Terminus		End Terminus
10	Cove	MP 0.00 at LTF in Jenkins Cove, Eastern Passage		MP 0.00 of Rd 1050 which is a continuation of the road.
Begin MP	Length	Status	Map Quarter Quad	Photo year, roll, photos
0.00	5.00	Opportunity	Petersburg (A-1)	
Road 1050 is a continuation of Road 10.				

<u>General Design Criteria and Elements</u>						
Functional	Service	Design				
Class	Life	Surface	Width	Speed	Critical Vehicle	Design Vehicle
Local	LI	Shot rock	14'	20 mph	Low bed truck	Logging Truck
				10 mph from junction with Rd. #1000-300 at MP 2.88 to terminus at MP 5.00		
Intended Purpose/Future Use						
Access for recurring silvicultural activities. Will be used for post-sale silviculture activities and future timber management.						

<u>Maintenance Criteria</u>				
Bmp	Emp	Operational Maintenance Level (Planned Initial Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	5.00	2		Active
0.00	2.72		2	Inactive
2.72	5.00		1	Closed
Maintenance Narrative				
AFR&P Reg's. "active" status: Keep culverts, catchbasins, ditches and roadblocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.				
AFR&P Reg's. "inactive" status: Stormproof MP 0.00 - 2.72 by providing drivable waterbars/rolling dips and outslope the road. Allow vehicle traffic up to MP 2.72.				
Storage AFR&P Reg's. "closed" status: Place road in storage, MP 2.72 - 5.00, remove or bypass high-risk culverts, add waterbars as needed. Close road to highway vehicle traffic by removing drainage structure at MP 2.72.				

<u>Operation Criteria for MP 0.00 to 2.72</u>	
Highway Safety Act:	No
Jurisdiction:	National Forest ownership
Traffic Management Strategies	Encourage:
	Hikers and mountain bikes after timber harvest.
	Accept:
	High clearance vehicles and non-highway vehicles after timber harvest.
	Discourage:
	Public traffic during timber harvest.
	Eliminate:
	Passenger highway vehicles.
	Prohibit:
	N/A

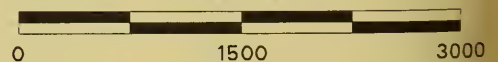


- Proposed Road Segment
- == Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- E Proposed LTF Sites
- ◆ Proposed Major Stream Crossing
- S Sort Yard

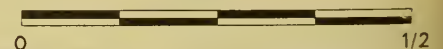
- ★ Eagle Nest Tree
- - - Proposed cut units
- ××× TTRA Buffers
- Wetlands
- 1/4 mile Eagle Nest Timing Buffer
- State/Private Land

Scale: 4" = 1 Mile

Scale in Feet



Miles



**Operation Criteria for MP 2.72 to 5.00**

<b>Highway Safety Act:</b>	No	<b>Jurisdiction:</b>	National Forest ownership
<b>Traffic Management Strategies</b>	<b>Encourage:</b>	N/A	
	<b>Accept:</b>	Hikers after timber harvest.	
	<b>Discourage:</b>	Public traffic during timber harvest. Mountain bikes and non-highway vehicles after harvest.	
	<b>Eliminate:</b>	Passenger highway vehicles and high clearance highway vehicles after timber harvest.	
	<b>Prohibit:</b>	N/A	

**Travel Management Narrative**

During timber harvest, the road will be open to high clearance highway vehicles and non-highway vehicles.

After timber harvest, the floating portions of the log transfer facility will be removed. Maintenance Level 2 will continue for Road 10 from Jenkins Cove to Gypsy Creek (2.72 miles), which will be open to high clearance vehicles and non-highway vehicles. However, given the expense and difficulty in accessing the road by vehicles, the preference for hunters and recreationists is likely to be in other areas. A few people may access the road system with non-highway vehicles, primarily during deer hunting season. Administrative traffic for post-sale silviculture purposes and road maintenance is expected to generate most of the traffic on the system.

After timber harvest, the road beyond Gypsy Creek (from MP 2.72 to MP 5.00), will be physically and administratively closed to all motorized vehicles, placed in storage, and maintained under Maintenance Level 1. Critical drainage structures will be removed and walk-in access will be allowed.



### Site Specific Design Criteria Road Segment Descriptions

Milepost (miles)	Grade* (%)	Average Side-slope (%)	Length (feet)	Comments
0.00 to 0.32	15f-5a	0-30	1700	This section will include upland LTF facilities. Class II stream crossing. Rock pit will be developed near the LTF site. Crosses forested wetlands to stay away from stream.
0.32 to 0.53	10-15f	20-40	1100	MP 0.53 is a 75-ft radius switchback with 10% road grade on a 25% side slope.
0.53 to 0.80	0-15f	25-40	1400	Possible rock pit with granite rock. MP 0.80 is a Class III stream requiring a 36-inch culvert.
0.80 to 1.03	5-12f	30-70	1220	200 feet of full bench rock blasting.
1.03 to 1.46	0-12f	0-25	2300	300 feet of muskeg crossing and several hundred feet of forested wetlands to avoid 1,000 foot beach buffer and steep side slopes.
1.46 to 1.84	0-15f	5-20	2000	Short segment of full bench. Skirts around corner of state lands. Skirts muskeg, forested wetlands.
1.84 to 2.31	5a-12a	15-40	2500	Two short segments of full bench construction. Five Class II and III streams. MP 2.31 was originally on a large Class II/III stream that requires two 60-inch culverts due to stream convergence. Crossing was moved 60 ft. upstream where only one large culvert is required. Potential rock pit in this section
2.31 to 2.72	12a-12f	10-40	2120	Five Class IV stream crossings. MP 2.72 is a Class II stream (Gypsy Creek) requiring a 40 foot bridge. Pull bridge and store road beyond MP 2.72 following harvest. Potential rock pit in this section.
2.72 to 2.95	12a-15f	0-20	1230	Skirts around muskeg through forested wetlands to avoid TTRA buffers. MP 2.95 is a small Class II stream with a history of beaver activity. Requires at least a 36-inch culvert designed for fish passage. Culvert will be removed following timber harvest.
2.95 to 3.02	12a-10f	0-15	370	Crosses a small ridge to another Class II stream which requires a 60-inch culvert or log stringer bridge to provide fish passage. Structure will be removed following timber harvest.
3.02 to 3.17	0-15f	0-20	820	Skirts muskeg through forested wetlands. Road needs to go in the muskeg for 100 ft to avoid entering a TTRA buffer.
3.17 to 3.43	0-15f	0-70	1350	200 feet of full bench construction. Segment ends where road crosses knife ridge line at old F.S. grade line (tagged as CP#4 on South Virginia Lake #1 RD)
3.43 to 3.65	8a-8f	20-30	1140	Possible rock pit in segment. MP 3.65 is close to ¼ mile Wild & Scenic buffer to Virginia Lake.
3.65 to 3.91	0-15f	20-40	1400	One short segment of side slopes greater than 40%. Possible small Karst sink hole 50 ft N. Limestone found.
3.91 to 4.11	5a-12f	30-60	1060	Crosses above a confluence of two Class III streams. Crosses a short segment of steep unstable slope out of the 2 <sup>nd</sup> crossing requiring full bench construction.
4.11 to 4.42	5a-15f	40-60	1640	Road follows a narrow bench for most of the segment. MP 4.42 is where the road crosses the narrow ridge. Some short segments of full bench construction.

Milepost (miles)	Grade* (%)	Average % Side-slope	Length (feet)	Comments
4.42 to 4.61	10a-15f	20-50	1000	Segment has a 50 ft section requiring full bench, rock blasting through head wall.
4.61 to 5.00	5a-15f	20-45	2030	Goes between muskegs and circles around ridgeline. Avoiding wetlands would require moving road onto steep slopes above Virginia Lake. Joins old road grade flag line. Possible rock pit at MP 4.88.

\*a = adverse; f = favorable

**Notes:** MP 2.63 abandoned old FS grade due to difficult stream crossing. Old grade is east of new grade.

<b>Stream Crossings:</b>	MP 0.32	Class II stream with HC0 channel type, 10 ft. max width, 2 ft. max. depth, 3 ft. incision, 12% gradient, cobble/small boulder substrate. Cutthroat verified 265 ft. upstream, requires fish passage, use 70" CMP or larger. Crossing should be moved 40 ft. upstream to a straight stretch in the stream alignment.
	MP 0.95	Class III stream with HC3 channel type, 7 ft. max width, 2 ft. max depth, 17% gradient upstream, bedrock falls 15 ft. downstream, boulder and bedrock substrate. No fish passage required; use 72" CMP or larger. Culvert will be on 10% grade. Gradient is 15%, cobble substrate, high debris jam potential; consider moving crossing down stream where streams have combined to one channel. Remove culverts or storm proof at closing.
	MP 2.31	Class II stream in v-notch, 10 ft. max width, 3 ft. max depth, 15% gradient, cobble substrate with large amount of stable LWD. Fish passage required unless crossing can be moved upstream; use 72" CMP or larger. Culvert will be on 10% grade. Crossing was moved 60 ft. upstream of original crossing, which would have required two v-notch crossings.
	MP 2.72	Class II stream (Gypsy Creek), 30 ft. max width, 4 ft. max depth, 4% gradient, large cobble and small boulder substrate, high bedload movement, braided channel upstream. Fish passage required. Estimate 40 to 60 ft. bridge with approach fills up to 8 ft. deep on both banks.
	MP 2.95	Class II stream, silt and gravel substrate, past beaver use below crossing, requires fish passage, Use 48"- 60" CMP (originally planned for 36") and remove after harvest.
	MP 3.02	Class II stream, 48-inch culvert, high flow is 5 ft wide and 2 ft deep, stream gradient is 1%, cobble and gravel substrate, low debris jam potential. Requires fish passage, use 81" x 59" squash pipe and bury 18"- 24" or use log stringer bridge. Remove culvert or pull bridge at closing.

**Wetlands:** Where practical the road went around wetlands but due to grades, horizontal alignment and increased length of roads, some wetlands were crossed (see Road Segment Description for details). BMP 12.5 applies to road construction on wetlands. Where terrain allows, overlay construction will be used, excavation will be avoided, and extra cross drains will be installed to avoid altering subsurface flow. The following is a list of wetland crossings for this road:

- MP 0.10-0.30 Forested wetland-possible sort yard
- MP 1.03-1.96 300 feet of muskeg, several hundred feet of forested muskeg
- MP 2.72-2.95 Forested wetland/edge of muskeg
- MP 3.02-3.17 Forested wetland/edge of muskeg
- MP 4.61-4.75 Forested wetland/edge of muskeg

**Erosion Control:** An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). Specific design measures will address erosion control in the vicinity of streams on the approach to the LTF and stream crossings. All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Noted areas of concern: MP 0.53 - 75 ft radius switch back; MP1.49 - full bench; MP 0.94 - 200 ft of full bench; MP 2.76 - end haul; MP 3.88 - small Sink hole/ Bog/ Karst; MP 3.17-3.43 - 200 ft of full bench; MP 4.11-4.61 - short full bench segments; stream crossings listed above.

**Rock Pits:** During periods of high rainfall (as defined in current regional specifications) blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock pits will require site specific erosion control plans (BMP 14.18). This road travels through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size and layout of a rock pit along this road. Sites noted as potential rock pits are listed below:

- MP 0.70 (granite); MP 2.23; MP 2.55; MP 3.54; MP 4.40; MP 4.88

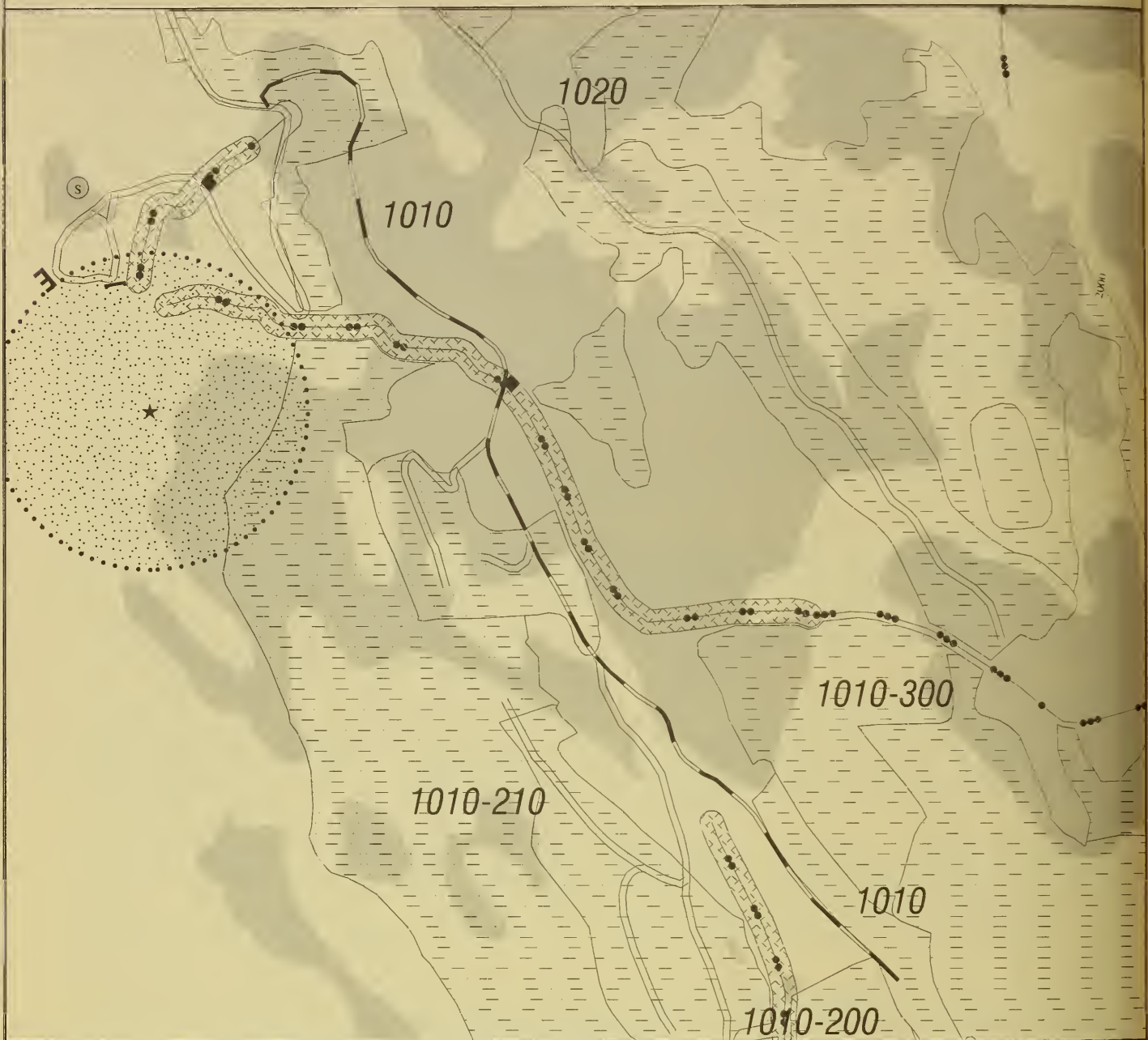
**Wildlife:** First approximately 200 ft of road is located within ¼ mile of bald eagle nest. Timing restrictions may apply. Avoid ground disturbance within 330 feet and repeated helicopter flights within ¼ mile of all nests from March 1 through May 31. Surveys needed prior to harvest to verify eagle nest activity. If nests are active, continue to avoid ground disturbance and repeated helicopter flight through August 31.

**Cultural Resources:** Road 10 inventoried for cultural resources from shore of Jenkins Cove to north of Unit J-49 and portion within and adjacent to Unit V-61. Lower end of road (at least to the 100 foot elevation) is within high sensitivity zone for cultural resources. Monitor road during or after construction in this area, as stated in the Programmatic Agreement among the USDA Forest Service Alaska Region, the Advisory Council on Historic Preservation, and the Alaska SHPO.

**Summary of Mitigation:** The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F5, F6, F8, F9, F10, F13, K3, W9, W13, R1, and V11. These measures are described within the resource sections that apply.



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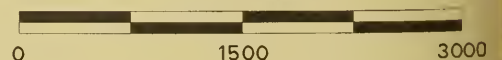


- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Proposed LTF Sites
- Proposed Major Stream Crossing
- Sort Yard

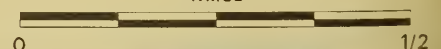
- Eagle Nest Tree
- Proposed cut units
- TTRA Buffers
- Wetlands
- 1/4 mile Eagle Nest Timing Buffer
- State/Private Land

Scale: 4" = 1 Mile

Scale in Feet



Miles



## ROAD MANAGEMENT OBJECTIVES

### Madan Project - Road 1010

<u>Road Description/Location</u>				
Project		System		Land Use Designation
Madan		Mainland		TM
Route No	Route Name		Begin Terminus	End Terminus
1010	Lower Madan		MP 0.83 Rd 10	Last landing in Unit J-10
Begin MP	Length	Status	Map Quarter Quad	Photo year, roll, photos
0.00	2.14	Opportunity	Petersburg (A-1)	

<u>General Design Criteria and Elements</u>						
<b>Functional</b>	<b>Service</b>				<b>Design</b>	
<b>Class</b>	<b>Life</b>	<b>Surface</b>	<b>Width</b>	<b>Speed</b>	<b>Critical Vehicle</b>	<b>Design Vehicle</b>
Local	LI	Shot rock	14'	10 mph	Lowbed truck	Logging Truck
<b>Intended Purpose/Future Use</b>						
Access for recurring silvicultural activities. Will be used for post-sale silviculture activities and future timber management.						

<u>Maintenance Criteria</u>				
<b>Bmp</b>	<b>Emp</b>	<b>Operational Maintenance Level (Planned Initial Condition)</b>	<b>Objective Maintenance Level (Desired Future Condition)</b>	<b>Alaska Forest Practices Act Class</b>
0.00	2.14	2		Active
0.00	2.14		2	Inactive
<b>Maintenance Narrative</b>				
<b>AFR&amp;P Reg's. "active" status:</b> Keep culverts, catchbasins, ditches and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.				
<b>AFR&amp;P Reg's. "inactive" status:</b> Stormproof MP 0.00 - 2.14 by providing drivable waterbars/rolling dips and outslope the road. Allow vehicle traffic up to MP 2.14.				

<u>Operation Criteria</u>		
<b>Highway Safety Act:</b>	No	<b>Jurisdiction:</b> National Forest ownership
<b>Traffic Management Strategies</b>	<b>Encourage:</b>	Hikers and mountain bikes after timber harvest.
	<b>Accept:</b>	High clearance vehicles and non-highway vehicles after timber harvest.
	<b>Discourage:</b>	Public traffic during timber harvest.
	<b>Eliminate:</b>	Passenger highway vehicles after timber harvest.
	<b>Prohibit:</b>	N/A



### Travel Management Narrative

The road will be maintained at Maintenance Level 2. It will be open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. After timber harvest the floating portions of the log transfer facility will be removed. Given the expense and difficulty in accessing the road by vehicles, the preference for hunters and recreationists is likely to be in other areas. A few people may access the road system with non-highway vehicles, primarily during deer hunting season. Administrative traffic for post-sale silviculture purposes and road maintenance are expected to generate most of the traffic on the system.

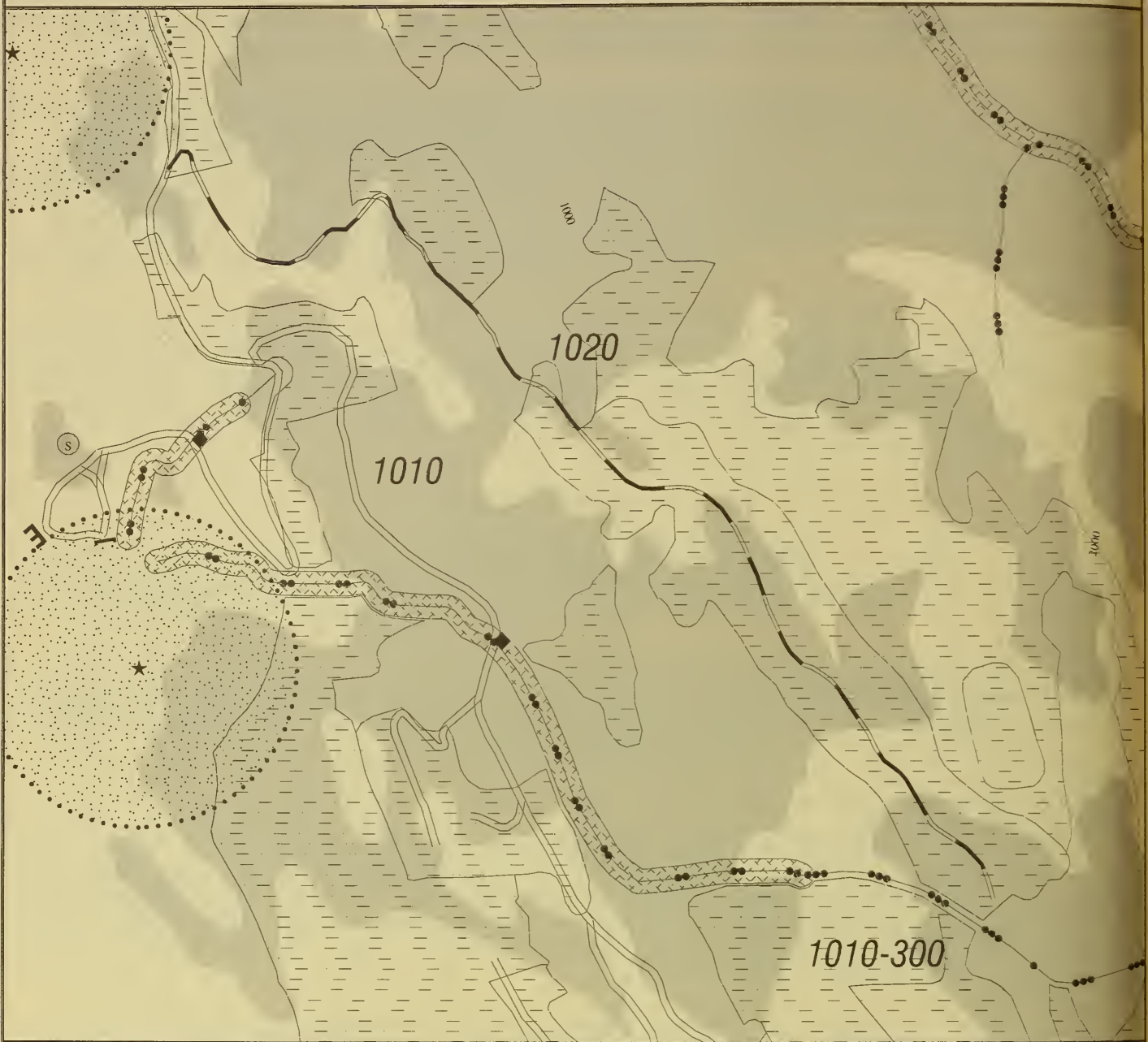
### Site Specific Design Criteria

#### Road Segment Descriptions

Milepost (miles)	Grade* (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.27	5f-16f	10-35	1400	Begin with 75' radius curve - through required for switchback. Medium construction difficulty with significant stream crossings (Class IV) at 0.16 & 0.21 miles. Some 50' full bench sections.
0.27 to 1.22	0-12f	15-25	5050	Easy to medium construction in forested wetland. Muskeg crossings were minimized, however several 50' openings were crossed. Class II stream at MP 0.82.(40'-50' Bridge)
1.22 to 1.45	10a-5f	15-35	1225	This accesses J-5. This section runs along a bench. Easy construction with a few wet areas in large timber.
1.45 to 1.74	10a-15f	40-50	1525	This segment contains steeper cross-slopes with road grades approaching the maximum for adverse and favorable (12% & 18%). The muskeg drainage stream is crossed below the muskeg at MP 1.59. The road then climbs the ridge to J-10. Some short full bench sections and possible quarry at MP 1.69.
1.74 to 2.14	15a-5f	15-25	2100	Easy construction on mild cross-slopes through Unit J-10 to end of road. No construction difficulties.

\*a = adverse; f = favorable

<b>Stream Crossings:</b>	MP 0.16	Class IV stream, no fish passage required. Use 48"– 60" CMP (originally planned for 36").
	MP 0.82	Class II stream (Jenkins Creek), with MM1 channel type, 14 ft. max width, 3 ft. max depth, 4 ft. incision depth, 2 % gradient, cobble and gravel substrate, bedrock exposed downstream, stable location, medium debris jam potential. Cutthroat observed in every pool. Fish passage required. Use 40-50 ft. bridge.
	MP 1.59	Class IV stream (flowing into Madan Bay) near divide of two drainages, 3 ft. max width, 3 ft. incision depth, <0.5% gradient, no fish passage required. Use 48"– 60" CMP (originally planned for 36").
<p><b>Wetlands:</b> Where practical the road went around wetlands but due to grades, horizontal alignment and increased length of roads, some wetlands were crossed (see Road Segment Description above for details). BMP 12.5 applies to road construction on wetlands. Where terrain allows, overlay construction will be used, excavation will be avoided, and extra cross drains will be installed to avoid altering subsurface flow. The following is a list of wetland crossings for this road:</p> <p>MP 0.27-1.22 Forested wetlands/several short muskeg crossings</p> <p>MP 1.4 At approximately this milepost, the map shows the road crossing a wetland. Additional field checking of this area was conducted in fall 2000. Based on that review, it appears that the road actually does avoid the wetland and the mapping was not accurate in this area.</p>		
<p><b>Erosion Control:</b> An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).</p>		
<p><u>Noted areas of concern:</u> Switchback at the beginning of the road will require through cut.</p>		
<p><b>Rock Pits:</b> During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock pits will require site specific erosion control plans (BMP 14.18). This road travels through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size and layout of a rock pit along this road. No potential rock pit sites were noted along this road. Potential rock pit sites were noted along Road 10 at MP 0.70, MP 1.00, MP 1.69.</p>		
<p><b>Summary of Mitigation:</b> The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F5, F6, F8, F10, F13, W9, and R1. These measures are described within the resource sections that apply.</p>		

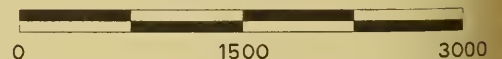


- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Proposed LTF Sites
- Proposed Major Stream Crossing
- Sort Yard

- Eagle Nest Tree
- Proposed cut units
- TTRA Buffers
- Wetlands
- 1/4 mile Eagle Nest Timing Buffer
- State/Private Land

Scale: 4" = 1 Mile

Scale in Feet



Miles





# ROAD MANAGEMENT OBJECTIVES

## Madan Project - Road 1020

<u>Road Description/Location</u>				
<b>Project</b>	<b>System</b>			<b>Land Use Designation</b>
Madan	Mainland			TM
<b>Route No</b>	<b>Route Name</b>	<b>Begin Terminus</b>		<b>End Terminus</b>
1020	Upper Madan	Jct with Rd 10 at MP 1.39		Landing in Unit J-31
<b>Begin MP</b>	<b>Length</b>	<b>Status</b>	<b>Map Quarter Quad</b>	<b>Photo year, roll, photos</b>
0.00	2.03	Opportunity	Petersburg (A-1)	

<u>General Design Criteria and Elements</u>						
<b>Functional</b>	<b>Service</b>	<b>Design</b>				
<b>Class</b>	<b>Life</b>	<b>Surface</b>	<b>Width</b>	<b>Speed</b>	<b>Critical Vehicle</b>	<b>Design Vehicle</b>
Local	LI	Shot rock	14'	10 mph	Logging Truck	Logging Truck
<b>Intended Purpose/Future Use</b>						
Access for recurring silvicultural activities. Will be used for post-sale silviculture activities and future timber management.						

<u>Maintenance Criteria</u>				
<b>Bmp</b>	<b>Emp</b>	<b>Operational Maintenance Level (Planned Initial Condition)</b>	<b>Objective Maintenance Level (Desired Future Condition)</b>	<b>Alaska Forest Practices Act Class</b>
0.00	2.03	2		Active
0.00	1.75		2	Inactive
1.75	2.03		1	Closed
<b>Maintenance Narrative</b>				
<b>AFR&amp;P Reg's. "active" status:</b> Keep culverts, catchbasins, ditches and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.				
<b>AFR&amp;P Reg's. "inactive" status:</b> Stormproof MP 0.00 – 1.75 by providing drivable waterbars/rolling dips and outslope the road. Allow vehicle traffic up to MP 1.75.				
<b>Storage AFR&amp;P Reg's. "closed" status:</b> The last 0.28 miles of Road 1020 (MP 1.75 to 2.03) will be constructed as an unclassified temporary spur road, and all drainage structures will be removed after harvest.				

		<b>Operation Criteria</b>	
Highway Safety Act:	No	Jurisdiction:	National Forest ownership
<b>Traffic Management Strategies</b>	Encourage:	Hikers and mountain bikes after timber harvest.	
	Accept:	High clearance highway vehicles and non-highway vehicles after timber harvest.	
	Discourage:	Public traffic during timber harvest.	
	Eliminate:	Passenger highway vehicles after timber harvest.	
	Prohibit:	N/A	

#### Travel Management Narrative

The road will be maintained at Maintenance Level 2. After harvest, it will be open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. After timber harvest the floating portions of the log transfer facility will be removed. Given the expense and difficulty in accessing the road by vehicles, the preference for hunters and recreationists is likely to be in other areas. A few people may access the road system with non-highway vehicles, primarily during deer hunting season. Administrative traffic for post-sale silviculture purposes and road maintenance are expected to generate most of the traffic on the system.

### Site Specific Design Criteria Road Segment Descriptions

Milepost (miles)	Grade* (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.66	0-10f	5-40	2460	Easy construction, crosses 1 Class IV and 3 non-streams. Good rock source at end of this section.
	8f-10a	15-30	1060	Short section of 10% adverse (180 ft) to Class IV stream. There are 2 Class IV streams in this section
0.66 to 1.18	3-15f	5-30	1070	Easy construction, crosses 1 Class IV stream.
	3f-12a	10-30	305	Road parallels muskeg and crosses at the south end to maintain elevation needed for road grade. The crossing is approx. 15-20 ft long.
	5-10f	10-50	1310	Road crosses 3 Class IV streams
1.18 to 2.03	16f	40	200	Crosses 1 Class IV stream.
	5f-5a	15-40	2215	Grade rolls following bench, crosses 4 Class IV streams. Class III stream at south end of segment.
	5-14f	30	290	Road climbs and catches several short benches.
	5a	30	275	
	16f	20-45	220	
	0-16f	30-80	955	
	0-10f	0-40	335	

\*a = adverse; f = favorable

**Stream Crossings:** MP 1.75 60-inch culvert or log stringer bridge. Pull this drainage structure after harvest.

**Wetlands:** Where practical the road went around wetlands but due to grades, horizontal alignment and increased length of roads, some wetlands were crossed (see Road Segment Description above for details). BMP 12.5 applies to road construction on wetlands. Where terrain allows, overlay construction will be used, excavation will be avoided, and extra cross drains will be installed to avoid altering subsurface flow. The following is a list of wetland crossings for this road:

MP 0.86-0.92 Road is in forested wetlands along muskeg and includes a very short muskeg crossing.

MP 1.3 According to the mapping, this road crosses a wetland inside Unit J-31. Based on additional field checking, the road was moved higher on the slope to allow better uphill yarding in Unit J-31. This move also results in the road being located outside of the mapped wetlands.

MP 0.86-0.92 Road is in forested wetlands along muskeg and includes a very short muskeg crossing.

**Erosion Control:** An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Noted areas of concern: None

**Rock Pits:** During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock pits will require site specific erosion control plans (BMP 14.18). This road travels through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size and layout of a rock pit along this road. Sites noted as potential rock pits are listed below:

MP 0.47 Granite Rock Pit

**Summary of Mitigation:** The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F10, F13, W9, and R1. These measures are described within the resource sections that apply.



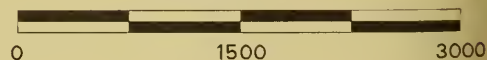


- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Proposed LTF Sites
- Proposed Major Stream Crossing
- Sort Yard

- Eagle Nest Tree
- Proposed cut units
- TTRA Buffers
- Wetlands
- 1/4 mile Eagle Nest Timing Buffer
- State/Private Land

Scale: 4" = 1 Mile

Scale in Feet



Miles



# ROAD MANAGEMENT OBJECTIVES

## Madan Project - Road 1050

<u>Road Description/Location</u>				
Project	System			Land Use Designation
Madan	Mainland			TM
Route No	Route Name	Begin Terminus		End Terminus
1050	Cove Extension	MP 0.00 at MP 5.00 of Road 10		Landing in Unit V-83
Begin MP	Length	Status	Map Quarter Quad	Photo year, roll, photos
0.00	1.75	Opportunity	Petersburg (A-1)	
Road 1050 is a continuation of Road 10.				

<u>General Design Criteria and Elements</u>						
Functional	Service	Design				
Class	Life	Surface	Width	Speed	Critical Vehicle	Design Vehicle
Local	LI	Shot rock	14'	10 mph	Logging Truck	Logging Truck
<b>Intended Purpose/Future Use</b> Access for recurring silvicultural activities. Will be used for post-sale silviculture activities and future timber management.						

<u>Maintenance Criteria</u>				
Bmp	Emp	Operational Maintenance Level (Planned Initial Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	1.75	2		Active
0.00	1.75		1	Closed
<b>Maintenance Narrative</b> <b>AFR&amp;P Reg's. "active" status:</b> Keep culverts, catchbasins, ditches and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.  <b>Storage AFR&amp;P Reg's. "closed" status:</b> Place road in storage remove or bypass culverts, add waterbars as needed.				

<b>Operation Criteria</b>		
<b>Highway Safety Act:</b>	No	<b>Jurisdiction:</b> National Forest ownership
<b>Traffic Management Strategies</b>	<b>Encourage:</b>	N/A
	<b>Accept:</b>	Hikers after timber harvest.
	<b>Discourage:</b>	Public traffic during timber harvest. Mountain bikes and non-highway vehicles after harvest.
	<b>Eliminate:</b>	Passenger highway vehicles and high clearance highway vehicles after timber harvest.
	<b>Prohibit:</b>	N/A

#### Travel Management Narrative

During timber harvest, the road will be open to high clearance highway vehicles and non-highway vehicles.

After timber harvest, the floating portion of the log transfer facility will be removed. The road will be closed and placed in storage and maintained at Maintenance Level 1. Critical drainage structures will be removed and walk-in access will be allowed.

#### Site Specific Design Criteria Road Segment Descriptions

Milepost (miles)	Grade* (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.41	10-18f	30-70	2150	Some short sections of Full bench/End haul required. No stream crossings. Climbing east side of ridge line. Route on West side of ridge was abandoned due to difficult construction; rock blasting and steep grades
0.41 to 0.50	10-15f	0-30	440	Crossing to ridge top bench along edge of muskeg for short distances.
0.50 to 0.71	10-15f	30-50	1100	Climbing to main ridgeline through good timber.
0.71 to 0.87	15f	20	863	Climbing on south side of main ridge. Crosses forested muskeg and upper end of muskegs. Muskeg could not be avoided and make an acceptable road grade to ridge top east.
0.87 to 1.75			4637	Following ridge top. Several notches and bumps require short segments of grades up to 18% to maintain ridge top location. Excellent logging access.

\*a = adverse; f = favorable



**Stream Crossings:** The road is the near ridge top, and therefore, no major streams or fish streams were crossed.

**Wetlands:** Where practical the road went around wetlands but due to grades, horizontal alignment and increased length of roads, some wetlands were crossed (see Road Segment Description above for details). BMP 12.5 applies to road construction on wetlands. Where terrain allows, overlay construction will be used, excavation will be avoided, and extra cross drains will be installed to avoid altering subsurface flow. The following is a list of wetland crossings for this road:

MP 0.80 to MP 1.03 has forested muskeg.

**Erosion Control:** An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).

Noted areas of concern: Sections will require rock blasting and full bench construction.

**Rock Pits:** During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock pits will require site specific erosion control plans (BMP 14.18). This road travels through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size and layout of a rock pit along this road. Sites noted as potential rock pits are listed below:

Field engineer said numerous possible rock pits are available on this road, but no specific locations were noted.

**Summary of Mitigation:** The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: K1, K3, F10, F13, W9, and R1. These measures are described within the resource sections that apply.

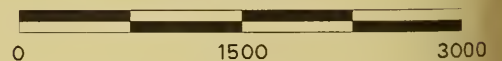


- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- E Proposed LTF Sites
- ◆ Proposed Major Stream Crossing
- S Sort Yard

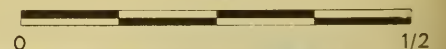
- ★ Eagle Nest Tree
- Proposed cut units
- TTRA Buffers
- Wetlands
- 1/4 mile Eagle Nest Timing Buffer
- State/Private Land

Scale: 4" = 1 Mile

Scale in Feet



Miles



## ROAD MANAGEMENT OBJECTIVES

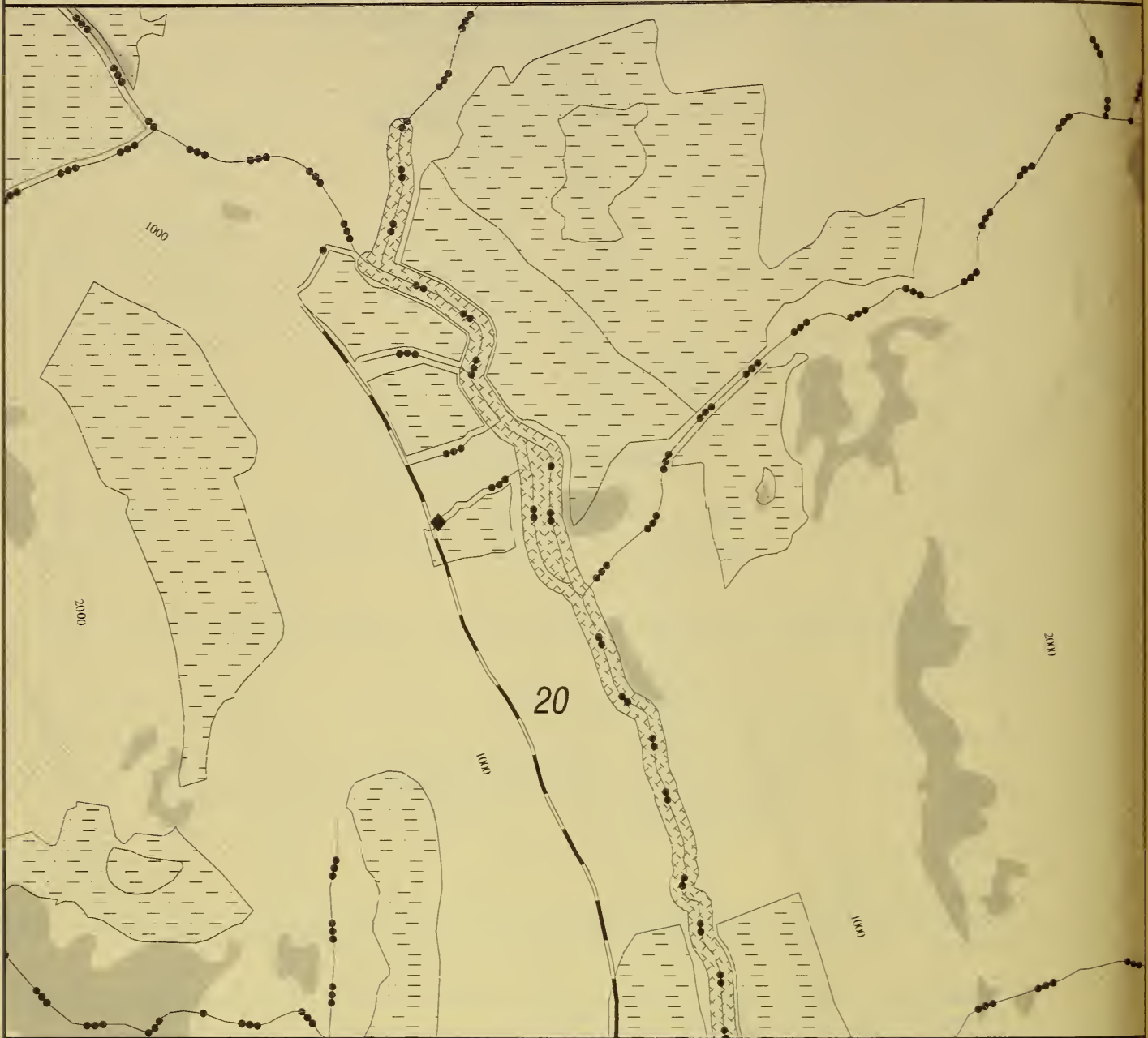
### Madan Project - Road 20

<u>Road Description/Location</u>				
Project	System			Land Use Designation
Madan	Mainland			TM
Route No	Route Name	Begin Terminus		End Terminus
20	Moose Creek	LTF near Moose Creek in Blake Channel		Landing in Unit M-123
Begin MP	Length	Status	Map Quarter Quad	Photo year, roll, photos
0.00	2.84	Opportunity	Petersburg (A-1)	

<u>General Design Criteria and Elements</u>						
Functional	Service	Design				
Class	Life	Surface	Width	Speed	Critical Vehicle	Design Vehicle
Local	LI	Shot rock	14'	10 mph	Low bed truck	Logging Truck
<b>Intended Purpose/Future Use</b> Access for recurring silvicultural activities. Will be used for post-sale silviculture activities and future timber management.						

<u>Maintenance Criteria</u>				
Bmp	Emp	Operational Maintenance Level (Planned Initial Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	2.84	2		Active
0.00	2.84		2	Inactive
<b>Maintenance Narrative</b> <b>AFR&amp;P Reg's. "active" status:</b> Keep culverts, catchbasins, ditches and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.  <b>AFR&amp;P Reg's. "inactive" status:</b> Stormproof MP 0.00 - 2.84 by providing drivable waterbars/rolling dips and outslope the road. Allow vehicle traffic up to MP 2.84.				



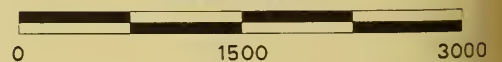


- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- E Proposed LTF Sites
- ◆ Proposed Major Stream Crossing
- S Sort Yard

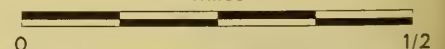
- ★ Eagle Nest Tree
- Proposed cut units
- TTRA Buffers
- Wetlands
- 1/4 mile Eagle Nest Timing Buffer
- State/Private Land

Scale: 4" = 1 Mile

Scale in Feet



Miles



		<b>Operation Criteria</b>	
Highway Safety Act:	No	Jurisdiction:	National Forest ownership
<b>Traffic Management Strategies</b>	Encourage:	Hikers and mountain bikes after timber harvest.	
	Accept:	High clearance highway vehicles and non-highway vehicles after timber harvest.	
	Discourage:	Public traffic during timber harvest.	
	Eliminate:	Passenger highway vehicles after timber harvest.	
	Prohibit:	N/A	

#### Travel Management Narrative

This road will be maintained at Maintenance Level 2. It will be open to high clearance highway vehicles and non-highway vehicles. Public travel on this isolated road system is expected to be very low. Given the expense and difficulty in accessing the road by vehicles, the preference for hunters and recreationists is likely to be in other areas. A few people may access the road system with non-highway vehicles, primarily during deer hunting season. Administrative traffic for post-sale silviculture purposes and road maintenance are expected to generate most of the traffic on the system.

### Site Specific Design Criteria Road Segment Descriptions

Milepost (miles)	Grade* (%)	Average Side-slopes (%)	Length (feet)	Comments
0.00 to 0.71	10-15f	30-60	3760	This stretch has some large cuts and sections of full bench construction. May be able to eliminate some full bench by re-alignment; see notes. Difficult construction.
0.71 to 0.99	10-15f	20-30	1460	This section follows a bench and accesses landings for M-117, skirting the edge of MMI4 soils in southwest portion of M-117. Should be potential for rock pits in the segment.
0.99 to 1.85	0-10f	50	4505	This section crosses several Class IV streams. The section has gentle grades. May need full bench construction or other measures to mitigate MMI4 soils near Unit M-119.
1.85 to 1.90	16f	35-50	330	This section is a constant pitch at 16% favorable to tie road from the south to previous grade from the north. Medium construction.
1.90 to 2.28	8f	45	1995	This section is a constant 8% grade that crosses several Class III and IV streams. Medium construction.
2.28 to 2.54	0	35	1390	This section has a rolling 2% grade and crosses several Class III and IV streams. Difficult construction due to streams.
2.54 to 2.84	0-8a	45	1532	This section also crosses several Class III and IV streams. Difficult construction due to streams.

\*a = adverse; f = favorable

**Note:** Original road grade started on the east side of Moose Creek and went up the east side of Moose Creek. The road alignment was changed due to the lack of rock near the East-Side LTF as well as unstable soils, significant V-notches and construction difficulties.

<b>Stream Crossings:</b> No bridges, fish streams or culverts $\geq 48$ inches were noted.
<b>Wetlands:</b> None noted.
<b>Soils:</b> Near the northwest corner of Unit M-119, a short distance of road goes through mapped MMI4 soils and needed a geologist or soil scientist field review of the road layout for final approval. Field review occurred in 2001, and the road location was determined to be stable.
<b>Erosion Control:</b> An erosion control plan for road construction and maintenance will be developed according to standard project specifications (BMP 14.5). Specific design measures will address erosion control in the vicinity of streams on the approach to the LTF and stream crossings. All areas of organic or mineral soil exposed during construction shall be grass seeded (with native species if possible) and fertilized (BMP 12.17, 14.8).
<b>Noted areas of concern:</b> MP 0.00 LTF; MP 0.00-0.71 Several full bench sections; MP 0.71 to 0.99 MMI4 area; MP 0.99 to 1.85 MMI4 area.
<p><b>Rock Pits:</b> During periods of high rainfall (as defined in current regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock pits will require site specific erosion control plans (BMP 14.18). This road travels through areas of visual concern and therefore attention to visual effects will be necessary when selecting location, size and layout of a rock pit along this road. Sites noted as potential rock pits are listed below:</p> <p>MP 0.00 Rock pit near LTF; No other obvious rock sources were noted. It may be difficult to find rock for the north end of this road.</p>
<b>Wildlife:</b> First approximately 1,500 ft of road is located within $\frac{1}{4}$ mile of bald eagle nest. Timing restrictions may apply. Avoid ground disturbance within 330 feet and repeated helicopter flights within $\frac{1}{4}$ mile of all nests from March 1 through May 31. Surveys needed prior to harvest to verify eagle nest activity. If nests are active, continue to avoid ground disturbance and repeated helicopter flight through August 31. A variance may be sought from USF&WS for activities within close proximity to the eagle nest near the LTF site.
<b>Cultural Resources:</b> Limited portions of Road 20 inventoried for cultural resources near the shore of Blake Channel. One cultural resources site and one Culturally Modified Tree were located along the shore and may be within the area potentially affected by the LTF. Lower end of road (at least to the 100 foot elevation) is within high sensitivity zone for cultural resources; monitor road during or after construction in this area, as stated in the Programmatic Agreement among the USDA Forest Service Alaska Region, the Advisory Council on Historic Preservation, and the Alaska SHPO.
<b>Summary of Mitigation:</b> The following mitigation measures were either taken into account during unit design or they will be applied during project implementation: F9, F13, F16, F17, W9, W13, R1, and V11. These measures are described within the resource sections that apply.



# Madan Timber Sale

## Final Environmental Impact Statement

July 2003

United States Department of Agriculture  
Forest Service - Alaska Region

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### Abstract:

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The Forest Service is proposing to implement the Tongass Forest Plan by harvesting timber in the Madan Project Area. This Final Environmental Impact Statement describes the effects of four action alternatives for harvesting timber and one no-action alternative. Under the action alternatives, 19 to 32 million board feet of timber would be made available for harvest within the Madan Project Area on the mainland portion of the Wrangell Ranger District. The key issues addressed by the alternatives and this EIS include: 1) scenic quality and recreation values, 2) timber management and economics, 3) wildlife habitat and species of concern, 4) road access management, and 5) the Madan inventoried roadless area. Other issues and environmental considerations are also addressed.



# SUMMARY



SUMMARY

# SUMMARY

## Introduction

The Madan Final Environmental Impact Statement (FEIS) was prepared by the Wrangell Ranger District of the Tongass National Forest to document the effects of a possible timber sale within the Madan Project Area near Wrangell Island. This is a summary of the FEIS, which was prepared in compliance with the National Environmental Policy Act (NEPA) and other federal and state laws and regulations. The Tongass Forest Supervisor will make the final decision, which will be documented in a Record of Decision (ROD).

## Changes Between the Draft EIS and the Final EIS

- Additional information is presented on the unit card maps and text (Appendix B) including the locations of landings (except for running skyline units where landings are expected to be continuous roadside landings), very high hazard soils, updated stream information, updated information on watershed/fisheries and soils/wetlands/karst, and expanded information in response to specific comments.
- Additional information is presented in the road card maps and text (Appendix C) including updated stream information and additional information on stream crossings.
- The terms road storage and stormproofing, and Options A and B for access management, have been clarified. In addition, road terminology has been updated.
- Transferring logs to a barge at an LTF is included as an option to transferring logs to water.
- Additional project-specific monitoring activities are identified and presented in Appendix G, either as part of Forest Plan monitoring or as routine implementation monitoring.
- An expanded discussion of wildlife corridors and associated project effects and the deer habitat model have been included.
- An expanded consideration of long-term effects of roads in the project area and associated cumulative effects has been included.
- The Madan Inventoried Roadless Area issue (Issue 5) was elevated to a key issue and analyzed in greater detail in the Final EIS because of passage of the Roadless Area Conservation Rule, public comments received on the Draft EIS, and the concurrent preparation by the Forest Service of a Supplemental EIS that evaluates roadless areas on the Tongass for wilderness recommendations.
- The Watershed and Fish Resources section has been updated with new information on streams. The financial efficiency analysis has been expanded to include the results of a preliminary financial appraisal conducted using the Forest Service's NEPA Economic Analysis Tool (NEAT).
- Miscellaneous errors have been corrected and other edits have been made to improve readability.

# Summary

There have also been national and Forest-wide policy changes between completion of the Draft and Final EIS documents.

## Project Area

The Project Area is located in Southeast Alaska on the mainland and is about 6 miles east of the town of Wrangell, Alaska (Figure 1-1 in Chapter 1). The Project Area, which is approximately 44,000 acres in size, includes Virginia Lake and Mill Creek (in the north), Madan Bay (in the southwest), and Moose Creek (in the southeast). The Tongass National Forest is divided into a common set of areas to facilitate resource inventory and interpretation. These areas, which generally encompass a drainage basin containing one or more large stream systems and follow easily recognizable watershed divides, are known as Value Comparison Units (VCUs). Portions of VCUs 502 and 504 are included in the Project Area.

The Project Area lies entirely within the Madan Inventoried Roadless Area #204. It is completely unroaded and no LTFs currently exist. The Roadless Area Conservation; Final Rule (Roadless Rule) was signed by the Secretary of Agriculture in January 2001. This rule generally established prohibitions on road construction, road reconstruction, and timber harvest in inventoried roadless areas on National Forest System lands. The Roadless Rule contains language which exempts projects which have had the Notice of Availability for their Draft EIS published prior to January 12, 2001. The Madan Timber Sale Project meets these exemption criteria.

Two small old-growth reserves (OGRs), one north of Virginia Lake and one between Madan Bay and Moose Creek, are also included in the area.

## Proposed Action

At the start of the planning process for this project, we defined a Proposed Action. This Proposed Action would harvest approximately 28 million board feet (MMBF) of sawlog and utility timber on approximately 1,900 acres in Value Comparison Units (VCUs) 502 and 504. This original Proposed Action has been refined into Alternative 2, which proposes to harvest approximately 32 MMBF on approximately 2,105 acres. Both helicopter and cable (or other ground-based) logging systems would be used, as would both clearcutting with reserve trees and partial cutting. Approximately 15 miles of road would be constructed in the Gypsy Creek, Glacier Creek, Jenkins Cove, and adjacent drainages, and 6 miles of road in the Moose Creek drainage. Two log transfer facilities (LTFs) would be constructed, one at Jenkins Cove and the other at Moose Creek.

The Proposed Action and all the action alternatives include a non-significant amendment to the Tongass Land and Resource Management Plan (TLMP), or Forest Plan, to increase the size of the two OGRs in the Madan Project Area. The changes to these OGRs would make them consistent with the Forest Plan in terms of size and amount of productive old-growth (POG) forest. In VCU 504, the Madan OGR would be increased by adding the area along Madan Bay, which is currently designated Scenic Viewshed management prescription. This change would increase the size of the reserve by approximately 905 acres. In VCU 502, the Virginia Lake OGR would be increased by adding the lower reaches of Porterfield and Glacier Creeks, which is currently designated Scenic Viewshed and Recreation River management prescriptions. This change would increase the size of the reserve by approximately 3,655 acres.



## Purpose and Need

The purpose and need for the Proposed Action is to respond to the goals and objectives identified by the Forest Plan for the timber resource while moving the project area towards the desired future condition for all resources. The reasons for scheduling a timber sale in this area at this time are discussed in Appendix A of the Final EIS.

The following Forest Plan goals and objectives are considered applicable to this project proposal:

- Manage the Tongass timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner (USDA Forest Service, 1997a: page 2-4).
- Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber and the demand for the planning cycle (USDA Forest Service, 1997a: pages 2-4, 3-126, 3-135, and 3-144).
- Recognize the scenic values of suitable timber lands viewed from selected popular roads, trails, water travel routes, recreation sites, bays and anchorages, and modify timber harvest practices accordingly (USDA Forest Service, 1997a: pages 3-126 and 3-135).
- Maintain and promote industrial wood production from suitable timberlands, providing a continuous supply of wood to meet society's needs (USDA Forest Service, 1997a: pages 3-135 and 3-144).
- Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska (USDA Forest Service, 1997a: page 2-3).
- Support a wide range of natural-resource employment opportunities within Southeast Alaska communities (USDA Forest Service, 1997a: page 2-3).
- Maintain a Forest-wide system of old-growth forest habitat to sustain old-growth associated species, and ensure that the reserve system meets the minimum size, spacing, and composition criteria (USDA Forest Service, 1997a: page 2-2 and Appendix K).

A preliminary analysis suggests that to achieve these goals, while meeting Forest Plan standards and guidelines, approximately 19 to 32 MMBF of timber could be harvested from approximately 1,350 to 2,100 acres.

## Public Scoping and Involvement

When a timber sale project begins, a group of professionals with a variety of educational backgrounds are designated as an interdisciplinary team (IDT). The Madan IDT conducted the planning process and prepared this document to inform the public and the Forest Supervisor of the environmental consequences of the Proposed Action and alternatives.

“Public scoping” is the term used to describe the process of identifying the significant issues for a project by contacting interested individuals and agencies to determine their concerns. The following is a summary of the letters, contacts, and meetings that took place during the planning of this project:

- January 1998: Agency scoping meeting held in Juneau, Alaska.

# Summary

- April 1998: Scoping letter sent out to identify issues.
- October 1998: Notice of Intent to prepare an EIS published in the Federal Register.
- October 1998: Second scoping/update letter sent out.
- October 1998: Second agency scoping/update meeting held in Juneau, Alaska.
- November 1998: Public Open House held in Wrangell, Alaska.
- April 1999: Meeting with Wrangell Cooperative Association, a federally recognized tribal government.
- A number of additional smaller meetings held with individuals, agencies, and organizations including the Alaska Department of Fish and Game (ADF&G), the U.S. Fish and Wildlife Service (USFWS), and the Wrangell Indian Resource Association.
- The Draft EIS issued in May 2000 for a 45-day review period. Copies were sent to interested persons, organizations, and agencies.
- Thirteen comment letters on the Draft EIS were received primarily in July 2000 (see Appendix H).
- March 2003: In accordance with Section 810 of the Alaska National Interest Lands Conservation Act, a subsistence hearing was held in Wrangell, Alaska, March 14, 2003, at the Wrangell Ranger District conference room. The date, time, and location of the subsistence hearing were publicized in the local media.

## Issues

Although there are often many potential issues and concerns associated with the planning of a timber sale, NEPA directs the analysis, in detail, of those issues that are significant. This ensures that the analysis and documentation are focused primarily on the issues that are most important to the specific project area and the decision to be made. Planning documents for other projects in the area were reviewed and comments were collected during the public participation process. This information, plus our knowledge of the Madan Project Area derived from field studies, was used to identify five key issues that form the basis for the analysis of alternatives. These key issues include:

- Scenic quality and recreation values,
- Timber management and economics,
- Wildlife habitat,
- Road access management, and
- The Madan Inventoried Roadless Area.

Other concerns are discussed in the Resource Reports and are summarized in Chapter 3.

## Items Common to All Action Alternatives

### *Access Management*

Two access options are being considered under each of the action alternatives (see Appendix F). Under Option A, most roads would be left open after harvest and stormproofed. There would also be selective road closures for short segments of the road system, and these roads would be placed in storage with the drainage structures removed.

Under Option B, most roads would be closed after harvest, either by barrier berms or by placing the road in storage.

## ***Logging Camps***

No land-based logging camps will be authorized for this timber sale. The purchaser may use a floating camp, which would be subject to state and federal permits, and operate only during project implementation. If used, this camp would most likely be located at Jenkins Cove. If an alternative that includes roads is selected, there can be some minor land-based facilities, such as a repair shop for trucks and other equipment, and storage facilities for fuel/lubricants or road-building explosives.

## ***Log Transfer Facilities (LTFs)***

One or two LTFs may be built to service the timber sale, depending on the alternative selected. One would be located at Jenkins Cove and the other near the mouth of Moose Creek. At Jenkins Cove, it would be a floating LTF just north of the cove and would include an equipment ramp inside the cove on the north shore. At Moose Creek, the LTF would be a low-angle ramp design and would be located to the west of the mouth of Moose Creek. After completion of the sale, all floating elements of the LTFs would be removed, but elements on shore would be maintained for possible future use. The LTFs could be designed to accommodate either watering or barging of logs, allowing flexibility for use of the facility within current environmental standards. In this Final EIS, the watering of logs was assumed for effects analysis because it would have greater environmental effects compared with barging of logs.

## ***Old-Growth Habitat Reserves (OGRs)***

An OGR is an area containing a contiguous unit of old-growth habitat managed to maintain the integrity of the old-growth forest ecosystem. The project area contains two small OGRs located near Madan Bay and Virginia Lake.

The Forest Plan directs that the size and shape of small OGRs should be reviewed and revised, if appropriate, during project evaluations. Based on an evaluation of the project area OGRs and their level of compliance with criteria established in the Forest Plan, the size and shape of both OGRs in the project area are proposed for revision in each of the action alternatives. The existing OGR boundaries would be retained with the No-Action Alternative.

The re-evaluation and design of both OGRs were a result of a cooperative effort between the USFS, ADF&G, and USFWS.

## ***Silvicultural Prescriptions***

The harvest units in each of the action alternatives would be harvested following one of four general prescriptions listed below. Each prescription incorporates reserve trees to various degrees.

**Clearcut with Minimum 10 Percent Retention** – Up to 90 percent of the merchantable timber volume would be harvested and a minimum of 10 percent of the merchantable volume would be retained in clumps or along setting boundaries. This prescription is generally used for units that do not have visual, slope stability, or reforestation concerns.



# Summary

**Patch Cut with Minimum 60 Percent Retention** – This prescription involves creating small openings up to 5 acres in size, scattered throughout the unit. This prescription is often used for units that have visual, slope stability, or reforestation concerns.

**Group Selection with Minimum 70 Percent Retention** – Groups of trees up to 2 acres in size would be harvested, scattered throughout the unit. This prescription is often used for units that have visual, slope stability, or reforestation concerns.

**Individual/Group Selection with Minimum 70 Percent Retention** – Individual trees and/or small groups up to 2 acres in size would be harvested, scattered throughout the unit. This prescription may include selection by diameter limits. This prescription is often used for units that have visual, slope stability, or reforestation concerns.

## **Sort Yards**

Two areas for log sorting have been identified; one is on the north side of Jenkins Cove and the other west of the mouth of Moose Creek. Each sort yard would occupy 3 to 4 acres, and at each location the sort yards would be developed away from the shoreline and out of sight.

## **Alternatives Considered in Detail**

The Proposed Action (Alternative 2) and four other alternatives are considered in detail in the Final EIS. Alternative 1 is the No-action Alternative. A description of each alternative is displayed below. They represent different ways to satisfy the Purpose and Need and to respond to the issues and concerns that were identified by the public and internally.

**Alternative 1: No Action** – This No-Action Alternative represented the existing conditions in the Madan Project Area and serves as a baseline against which the effects of the other alternatives are measured.

Under this alternative, the effects of not harvesting timber or building roads in the Madan Project Area at this time are analyzed. This alternative would respond to the issues of scenic quality, recreation value, the maintenance of existing roadless character, and wildlife habitat protection, including old-growth forests, by not building roads or harvesting timber. This alternative, however, would not respond to the issue of providing employment and contributing to the local economy, and would not contribute sawtimber or other wood products to meet the annual demand for Tongass National Forest timber from the Madan Project Area, as described in the Purpose and Need (Chapter 1). Under this alternative, the small OGRs, located at Virginia Lake and Madan Bay, would remain as mapped in the Forest Plan.

This alternative would not move the Madan Project Area towards the desired future condition described in the Forest Plan (USDA Forest Service, 1997a). The existing condition would continue to be influenced by natural disturbance processes. In addition to providing an alternative to the action alternatives, the No-Action Alternative provides a benchmark that allows the decision-maker to compare the magnitude of the environmental effects of the action alternatives with the current condition (CEQ Regulations, Section 1502.14(c)).

**Alternative 2: Proposed Action** – This alternative emphasizes economic timber harvest within the constraints of Forest Plan standards and guidelines. Timber volume is maximized to the extent that a reasonable economic timber harvest can be achieved. The

Proposed Action includes the harvest of approximately 32 MMBF from approximately 2,105 acres and involves the development of approximately 21 miles of road, including 3 miles of temporary road. This alternative focuses on establishing the infrastructure in this initial entry for use in subsequent entries. It constructs LTFs at Moose Creek and Jenkins Cove, and features timber development within Virginia Lake, Gypsy Creek, Jenkins Cove, and Moose Creek watersheds. The Proposed Action employs a variety of harvest methods including helicopter, live and running skyline, and highlead systems, but generally relies more on conventional silvicultural prescriptions (i.e., clearcuts) with minimum 10 percent volume retention.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of productive old-growth (POG), based on recommendations from the IDT and resource agencies.

**Alternative 3** – Alternative 3 reduces road construction and acres of treatment within the Moose Creek watershed. This alternative defers road construction and timber harvest entirely within the Virginia Lake watershed. It also reduces road construction within the Jenkins Cove and Gypsy Creek watersheds. Alternative 3 includes the harvest of approximately 19 MMBF from approximately 1,719 acres and involves the development of approximately 9 miles of road, including 1 mile of temporary road. It retains conventional harvest prescriptions and methods adjacent to the constructed road segments, but proposes non-conventional prescriptions for the majority of the suitable timber within the Jenkins Cove watershed. The management prescription includes individual/group selection harvest by helicopter with approximately 25 percent stem removal within the suitable stratum. Two LTFs, one at Jenkins Cove and the other at Moose Creek, would still be constructed.

Because of the large amount of selection harvest and the low density of roads, this alternative is the second-most responsive to the scenic issue and addresses the road development/access management and wildlife habitat/species conservation issues. Future road development options and harvest opportunities within the Moose Creek and the Virginia Lake watersheds are retained.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, based on recommendations from the IDT and resource agencies.

**Alternative 4** – Alternative 4 emphasizes helicopter harvest and minimizes road construction. This alternative defers all treatment and no roads are constructed within the Virginia Lake watershed (as in Alternative 3) and also throughout most of the Gypsy Creek watershed. Within the Jenkins Cove watershed, all harvest would be by individual or group selection. This alternative would construct 0.3 mile of road and a sort yard, and all harvest would be by helicopter with approximately 25 percent stem removal within the suitable stratum. Stem removal would be increased to 50 percent in Units J-5, J-10, and J-13 because these units are generally not seen. This alternative also includes two barges to provide for economical helicopter yarding distances; one would be south of Jenkins Cove and the other at the head of Madan Bay. In these areas, logs would be yarded directly to the barges and limbed. Then they would either be loaded onto an adjacent barge for transport or returned to the LTF for sorting and bundling.

In the Moose Creek drainage, the LTF and transportation system would be fully developed and harvest would be close to the same level and utilizing the same prescriptions as in Alternative 2. This level of harvest is consistent with the Forest Plan designation of Timber Production; this may be necessary to create an economically viable alternative.



# Summary

Alternative 4 includes the harvest of approximately 19 MMBF from approximately 1,769 acres and involves the development of approximately 7 miles of road, including 1 mile of temporary road.

Because of the high proportion of selection harvest and the lack of roads, this action alternative is the most responsive to the scenic issue and addresses the road development/access management and wildlife habitat/species conservation issues. Future road development options and harvest opportunities within the Virginia Lake watershed are retained.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, based on recommendations from the IDT and resource agencies.

**Alternative 5** – Alternative 5 defers all treatment within the Moose Creek watershed in an effort to maintain the integrity of all resource values in this watershed, but maintains future options for harvest and road construction. This alternative treats the Virginia Lake, Gypsy Creek, and Jenkins Cove watersheds at the same level as in Alternative 2. This includes maximum road development and conventional harvest where practical. It includes the harvest of approximately 21 MMBF from approximately 1,352 acres, and involves the development of approximately 15 miles of road, including 2 miles of temporary road. Only the Jenkins Cove LTF would be developed.

This alternative is responsive to the road development/access management and wildlife habitat/species conservation issues in the Moose Creek watershed. In other areas, it emphasizes economic timber harvest within the constraints of Forest Plan standards and guidelines.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, based on recommendations from the IDT and resource agencies.

## Effects of Alternatives

The alternatives are compared and evaluated relative to the significant issues in the following paragraphs:

### *Issue 1: Scenic Quality and Recreation Values*

There is concern about how this sale would affect scenic quality and recreation values, particularly in and around Virginia Lake and along the Eastern Passage (Back Channel). All alternatives are designed to be consistent with the Forest Plan by meeting the Visual Quality Objectives (VQOs) of Retention and Partial Retention that are prescribed for the areas seen from visual priority travel routes and use areas. Alternative 1 would result in no changes along visual priority travel routes and use areas, or anywhere in the Project Area. Alternatives 3 and 4 would result in the least noticeable harvest activities among the action alternatives. Both alternatives would completely avoid the Virginia Lake watershed, and Alternative 4 would not permit any clearcutting and only minimal road building, except in “not seen” areas within the Moose Creek watershed. Alternative 2 is the least responsive alternative for maintaining current scenic quality. Because of the extent of proposed harvest in the Virginia Lake and Jenkins Cove watersheds, some viewers would notice the alteration; however, the level of alteration would be subordinate to the characteristic landscape. Alternative 5 would have almost the same degree of alteration along visual priority travel routes and use areas as Alternative 2, but



would not include any harvest in the Moose Creek drainage. Two LTFs would be visible from the Eastern Passage under Alternatives 2, 3, or 4, one would be visible under Alternative 5, and none would be visible under Alternative 1.

Alternative 1 would not result in any change in the recreation settings of the Madan Project Area. Alternative 4 would have the smallest effect among the action alternatives, resulting in a decrease of approximately 1,380 acres of non-motorized Recreation Opportunity Spectrum (ROS) settings. Alternatives 3 and 5 would result in an intermediate decrease of non-motorized ROS settings and Alternative 2 would decrease non-motorized settings by approximately 4,356 acres.

Under the action alternatives, Option A (roads mostly open after sale) would allow limited use by high-clearance highway vehicles as well as full use by non-highway/all-terrain vehicles, mountain bikers, and hikers. Option B (roads mostly closed after sale) would not allow use by motorized vehicles but would allow full use by mountain bikers and hikers. See Appendix F (Appendix Table F-1) for detail on specific road segments for each option.

## ***Issue 2: Timber Management and Economics***

This issue deals with concerns regarding the amount of timber to be harvested, the long-term timber supply, the effect on local communities, and the economic viability of the sale. Of the 17 million acres that make up the Tongass National Forest, approximately 10 million acres are identified as forestland. The Forest Plan allocates 664,000 of these acres, or approximately 7 percent of the forestland, as suitable for timber management. The Project Area includes about 10,000 acres of suitable timberlands, or about 1.5 percent of the suitable land, and 0.2 percent of the productive forestland on the Tongass National Forest. Because of OGR expansion under the action alternatives, the suitable timberlands in the Madan Project Area would be reduced by about 1,084 acres. The Madan Timber Sale proposes up to 2,105 acres for timber management, or up to 0.3 percent of the suitable lands, and less than 0.1 percent of the productive forest land on the Tongass National Forest. The project would have a positive effect on the local timber industry in Wrangell, with the greatest positive benefits being produced by Alternative 2 and the smallest being derived from Alternatives 3 and 4. Alternative 1 would indirectly have negative effects on the local economy by contributing to the continuation of negative trends in the timber industry.

The economic viability of the timber sale is of concern to industry and the public. In Chapter 3, alternatives are compared under a high market and a low market scenario. All action alternatives produce positive net stumpage values under the high market and negative net stumpage values under the low market scenarios (Table 2-1). Chapter 3 also presents estimates of the expected bid value for each alternative under current (June 2002) market conditions. These estimates were developed with the NEPA Economic Analysis Tool (NEAT), a spreadsheet model developed by the Forest Service for this purpose. All action alternatives produce negative expected bid values under current market conditions.

Actual stumpage returns are very difficult to predict and the estimated values should be considered relative values for alternative comparisons, rather than definitive predictions of actual returns. Results indicate that in terms of economic efficiency, Alternatives 2 and 5 would be best, followed by Alternatives 3, and 4, respectively. The primary reason for the lower economic efficiency under Alternative 3 or 4 is the high proportion of volume that is planned for helicopter yarding under these alternatives.

## ***Issue 3: Wildlife Habitat***

The Forest Plan has identified a conservation strategy to ensure wildlife viability on the Tongass National Forest that is based heavily on a series of large, medium, and small OGRs and connectivity among them. The Madan Project Area includes two small OGRs that are part of this system. Both OGRs are smaller in size and the Virginia Lake OGR also contains less POG than is recommended by the Forest Plan. Under Alternative 1, the OGRs would not be modified and would remain the same in size; however, there would be no timber management in adjacent areas and such areas could be used for future old-growth unit expansion if needed. Under Alternatives 2, 3, 4, and 5, both OGRs would be expanded based on recommendations of the team of biologists who studied them, and would meet or exceed the minimum Forest Plan recommendations for both total size and amount of POG.

The other major part of the Forest Plan conservation strategy relates to the management of the lands where timber harvest may occur according to a set of standards and guidelines. The Madan action alternatives involve extensive use of a variety of silvicultural techniques designed to enhance wildlife diversity over time. A portion of the lands are proposed for clearcutting, but at least 10 percent reserve trees would be left behind as legacies. Most of the lands involved in each alternative have a prescription of individual tree or group selection that would provide much greater structural diversity over time. Alternative 2 would affect the greatest number of acres and Alternative 5 would have the fewest acres treated; however, Alternatives 2 and 5 would result in the greatest number of clearcut acres and Alternatives 3 and 4 would result in the least number of clearcut acres.

Other factors that relate to this issue are the change in deer habitat capability over time, future road densities, and the areas of high value habitats to be harvested. Deer habitat capability declines would range from 0 percent under Alternative 1 to a maximum of 6.4 percent, over time, under Alternative 2. Future road densities in the Wildlife Analysis Areas (WAAs) under all action alternatives would remain far below the 0.7-mile per square mile of open roads recommended for the protection of wolves. High value habitats for marten, northern goshawks, and marbled murrelets would not be affected under Alternative 1. The heaviest harvest of high value marten and murrelet habitat would be under Alternative 2 and for goshawks under Alternative 4. Lowest effects on high value habitats for marten, goshawks, and murrelets, under the action alternatives, would occur under Alternative 5.

## ***Issue 4: Road Access Management***

This issue deals with future accessibility within the Madan Project Area. It is related to how many roads are constructed and how those roads are managed after construction. No roads would be constructed under Alternative 1, but almost 19 miles of permanent forest roads would be developed under Alternative 2. Alternative 5 would result in the development of approximately 13 miles of permanent roads and Alternatives 3 and 4 would result in approximately 8 and 6 miles of permanent road development, respectively. Temporary road development would be limited to between 0.6 and 2.6 miles under the action alternatives. Following harvest, all temporary roads would be decommissioned and permanent roads would be left open or closed, depending on the road management option selected. Another aspect of this issue is balancing the benefits of public recreation and use of the area after the timber sale harvest, with the costs of long-term road maintenance and impacts to wildlife, watersheds, and fish, in an area relatively close to the community of Wrangell.



To analyze effects of a range of road management alternatives, two road management options are being considered under all action alternatives. Option A would manage the majority of the classified road system as open. Option B would manage the specified road system as closed after timber harvest was complete. Permutations with the range of these options are possible with some roads managed as open and others closed. Appendix F (Appendix Table F-1) describes the maintenance and traffic management strategies proposed for each road segment.

## ***Issue 5: Madan Inventoried Roadless Area***

The Madan Project Area is part of an extensive mainland area that is currently unroaded. Building roads in previously unroaded areas is of national concern, as well as being a local issue, and is the subject of the recently issued Roadless Area Conservation Rule (although the Madan Project was exempted from the final rule by a mitigation measure). A Tongass-wide roadless area evaluation for wilderness recommendations was recently published as a Supplemental EIS (USDA Forest Service, 2003) to the Forest Plan. Some people would like to see no roads constructed in the Project Area, while others would like to see roads built for recreation and subsistence activities, as well as for timber harvest. Under Alternative 1, no change would occur in the size of the Madan Inventoried Roadless Area (#204) of 69,738 acres. The action alternatives would result in timber harvest and road construction within the roadless area and this would reduce the size of the Madan Inventoried Roadless Area by an amount ranging from 1,930 acres under Alternative 4 (3 percent) to 5,852 acres under Alternative 2 (80 percent). The areas that contain the highest values for resources, other than timber management, would not be roaded.





## Summary

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# ACRONYMS

ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AHRS	Alaska Heritage Resource Survey
ANCSA	Alaska Native Claims Settlement Act of 1971
ANILCA	Alaska Native Interest Lands Conservation Act of 1980
APC	Alaska Pulp Company
ATV	all-terrain vehicle
BA	Biological Assessment
BE	Biological Evaluation
BF	board feet
BMP	Best Management Practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMT	Culturally Modified Tree
Corps	U.S. Army Corps of Engineers
CRIA	Civil Rights Impact Analysis
CZMA	Coastal Zone Management Act of 1976
dbh	diameter breast height
DGC	Division of Governmental Coordination
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FSH	Forest Service Handbook
GIS	geographic information system
GMU	Game Management Unit
HC	High Gradient Contained Process Group
HCI	habitat capability index
HCM	habitat conservation model
HIS	Habitat Suitability Index
IDT	Interdisciplinary Team
km	kilometer
KPC	Ketchikan Pulp Company
KVA	Key Viewing Area
LSTA	Logging Systems Transportation Analysis
LTF	log transfer facility
LUD	Land Use Designation
LWD	large woody debris
MBF	thousand board feet
MIS	Management Indicator Species
MMBF	million board feet
MMI	Mass Movement Index
MP	Mile Post
National Register	National Register of Historical Places
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act of 1976

## ACRONYMS (continued)

NHPA	National Historic Preservation Act
NIC	Non-Interchangeable Component
NMFS	National Marine Fisheries Service
NSRA	Northern Southern Regional Aquaculture Association
NWI	National Wetland Inventory
OGR	old-growth reserve
P	Primitive
POG	productive old growth
Project Area	Madan Project Area
RM	Roaded Modified
RMA	Riparian Management Area
RN	Roaded Natural
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RPA	Resources Planning Act of 1974
SHPO	State Historic Preservation Office
SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Non-Motorized
TES	threatened, endangered, and sensitive
TLMP	Tongass Land Management Plan
TLRMP	Tongass Land and Resource Management Plan
TRUCS	Tongass Resource Use Cooperative Survey
TSPIRS	Timber Sale Program Information Reporting System
TTRA	Tongass Timber Reform Act of 1990
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VAC	Visual Absorption Capability
VCU	Value Comparison Unit
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area

# CHAPTER 1

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# CHAPTER 1

## MANAGEMENT AND THE FUTURE



# CHAPTER 1

## PURPOSE AND NEED

### Introduction

This Final Environmental Impact Statement (EIS) was prepared by the Wrangell Ranger District of the Tongass National Forest to document the effects of a possible timber sale within the Madan Project Area (Project Area) near Wrangell Island. This EIS is being prepared in compliance with the National Environmental Policy Act (NEPA) and other federal and state laws and regulations. The Tongass Forest Supervisor will make the final decision, which will be documented in a Record of Decision (ROD).

The Roadless Area Conservation; Final Rule (Roadless Rule) was signed by the Secretary of Agriculture in January 2001. This rule generally established prohibitions on road construction, road reconstruction, and timber harvest in inventoried roadless areas on National Forest System lands. The Roadless Rule contains language which exempts projects that have had the Notice of Availability for their Draft EIS published prior to January 12, 2001. The Madan Timber Sale Project meets these exemption criteria.

This document describes the effects of a proposed timber sale on the mainland known as the Madan Timber Sale. It describes the No-Action Alternative (Alternative 1), the Proposed Action (Alternative 2), and three alternative strategies for harvesting timber. The action alternatives also include building and maintaining roads, and building and maintaining log transfer facilities (LTFs). This EIS discloses the environmental effects and resource outputs that are expected from each of the alternatives and potential mitigation measures.

This Final EIS was prepared according to the format established by Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500-1508). In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated.

The Madan Project implements direction contained in the 1997 Tongass Land and Resource Management Plan, as amended (herein referred to as the Forest Plan), and tiers to the Forest Plan Final EIS (1997b). It also relies on direction contained in the Tongass Timber Reform Act (TTRA), the Resources Planning Act (RPA), and FSM 2410 R10 Supplement 2400-2002-1 (May 2002). Many of these publications are available at public libraries around the region and they are all located at the Forest Supervisor's Offices in Petersburg, Sitka, and Ketchikan, Alaska.

### Changes Between the Draft EIS and the Final EIS

The Final EIS incorporates several changes relative to the Draft EIS. Most of these changes were implemented either in response to comments on the Draft EIS by the public,



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organizations, and agencies, or as a result of new information. The alternatives considered in the Final EIS are the same as those considered in the Draft EIS, with one exception: LTFs are designed to accommodate either watering or barging of logs, allowing flexibility for use of the facility within current environmental standards.

Refined or updated information was obtained from a number of sources, including the comments received on the Draft EIS. In addition, updated information was obtained from field surveys conducted after the Draft EIS was published. Expanded information or analyses are also presented in response to comments on the Draft EIS. The changes between the Draft and Final EIS include:

- Additional information is presented on the unit card maps and text (Appendix B) including the locations of landings (except for running skyline units where landings are expected to be continuous roadside landings), very high hazard soils, updated stream information, updated information on watershed/fisheries and soils/wetlands/karst, and expanded information in response to specific comments.
- Additional information is presented in the road card maps and text (Appendix C) including updated stream information and additional information on stream crossings.
- The terms road storage and stormproofing, and Options A and B for access management, have been clarified. In addition, road terminology has been updated.
- Transferring logs to a barge at an LTF is included as an option to transferring logs to water.
- Additional project-specific monitoring activities are identified and presented in Appendix G, either as part of Forest Plan monitoring or as routine implementation monitoring.
- An expanded discussion of wildlife corridors and associated project effects and the deer habitat model have been included.
- An expanded consideration of long-term effects of roads in the project area and associated cumulative effects has been included.
- The Madan Inventoried Roadless Area issue (Issue 5) was elevated to a key issue and analyzed in greater detail in the Final EIS because of passage of the Roadless Area Conservation Rule, public comments received on the Draft EIS, and the concurrent preparation by the Forest Service of a Supplemental EIS that evaluates roadless areas on the Tongass for wilderness recommendations.
- The Watershed and Fish Resources section has been updated with new information on streams.
- The financial efficiency analysis has been expanded to include the results of a preliminary financial appraisal conducted using the Forest Service's NEPA Economic Analysis Tool (NEAT).
- Miscellaneous errors have been corrected and other edits have been made to improve readability.

There have also been national and Forest-wide policy changes between completion of the Draft and Final EIS documents.



## Roadless Area Conservation Rule and Transportation Policy

Currently the Roadless Area Conservation Rule (Roadless Rule, January 12, 2001) is in effect and is the subject of a number of lawsuits. The Department of Agriculture and the Department of Justice have entered into an agreement with the State of Alaska (signed June 10, 2003) settling the state's lawsuit challenging the applicability of the Roadless Rule in Alaska. The Department of Agriculture committed to publishing for comment a proposed amendment to the Roadless Rule that excludes the Tongass National Forest. Publication of this proposed amendment is scheduled for the end of June 2003 and includes a public comment period. The Department made no representation regarding the content or substance of any final amendment to the Roadless Rule that may result.

While the Roadless Area Conservation Rule was being developed, the Forest Service was also developing a revised National Forest Transportation Policy that, among other requirements, addressed road-related activities within National Forest System unroaded lands. In addition, the forest-scale roads analysis process (RAP) was completed for the Tongass in January 2003. The Forest Supervisor found that this was consistent with the Forest Plan and no amendment was needed.

## Forest Plan Supplemental EIS

In *Sierra Club v. Lyons* (J00-0009CV [JKS]), the U.S. District Court, District of Alaska directed the Forest Service to prepare a supplemental environmental impact statement (SEIS) that evaluates and considers roadless areas within the Tongass for recommendation as potential wilderness areas. On April 26, 2002, the Court enjoined the Forest Service from permitting timber harvest and road building in roadless areas until 45 days after publication of the Final SEIS. The Notice of Availability for the Final SEIS and Record of Decision appeared in the Federal Register on March 7, 2003. The court-ordered injunction was lifted on April 21, 2003.

## Document Organization

**Chapter 1** provides the purpose and need for the proposed project, the public issues surrounding the action, and other introductory information. It also discusses how the Madan Timber Sale relates to the Forest Plan, NEPA, the key issues driving the EIS analysis, and the authorities guiding the EIS process. This chapter also presents a summary of the changes between the Draft and Final EIS.

**Chapter 2** describes and compares the alternatives for the proposed activities. It includes summary information on their environmental impacts, implementation, and mitigation.

**Chapter 3** describes the existing environment and predicts environmental effects likely to occur with implementation of the alternatives. These effects include both direct and indirect impacts of each alternative on the human and natural environment for each resource issue. Potential cumulative impacts of reasonably foreseeable or similar actions are also disclosed.

**Chapter 4** contains the list of references cited. **Chapter 5** provides a glossary (which will be especially useful to reviewers unfamiliar with technical terms or some of the more relevant laws regarding environmental analyses). **Chapter 6** contains the Final EIS

# 1 Purpose and Need

distribution list. **Chapter 7** gives a list of the Final EIS preparers. **Chapter 8** provides an index.

The **appendices** include supporting information on units, roads, LTFs, mitigation, and how this sale fits in with the Tongass-wide timber sale program. This EIS incorporates documented analysis by summarization and reference where appropriate.

## Project Area

The Project Area is located in Southeast Alaska on the mainland and is about 6 miles east of the town of Wrangell, Alaska (Figure 1-1). The Project Area, which is approximately 44,000 acres in size, includes Virginia Lake and Mill Creek (in the north), Madan Bay (in the southwest), and Moose Creek (in the southeast). The Tongass National Forest is divided into a common set of areas to facilitate resource inventory and interpretation. These areas, which generally encompass a drainage basin containing one or more large stream systems and follow easily recognizable watershed divides, are known as Value Comparison Units (VCUs). Portions of VCUs 502 and 504 are included in the Project Area.

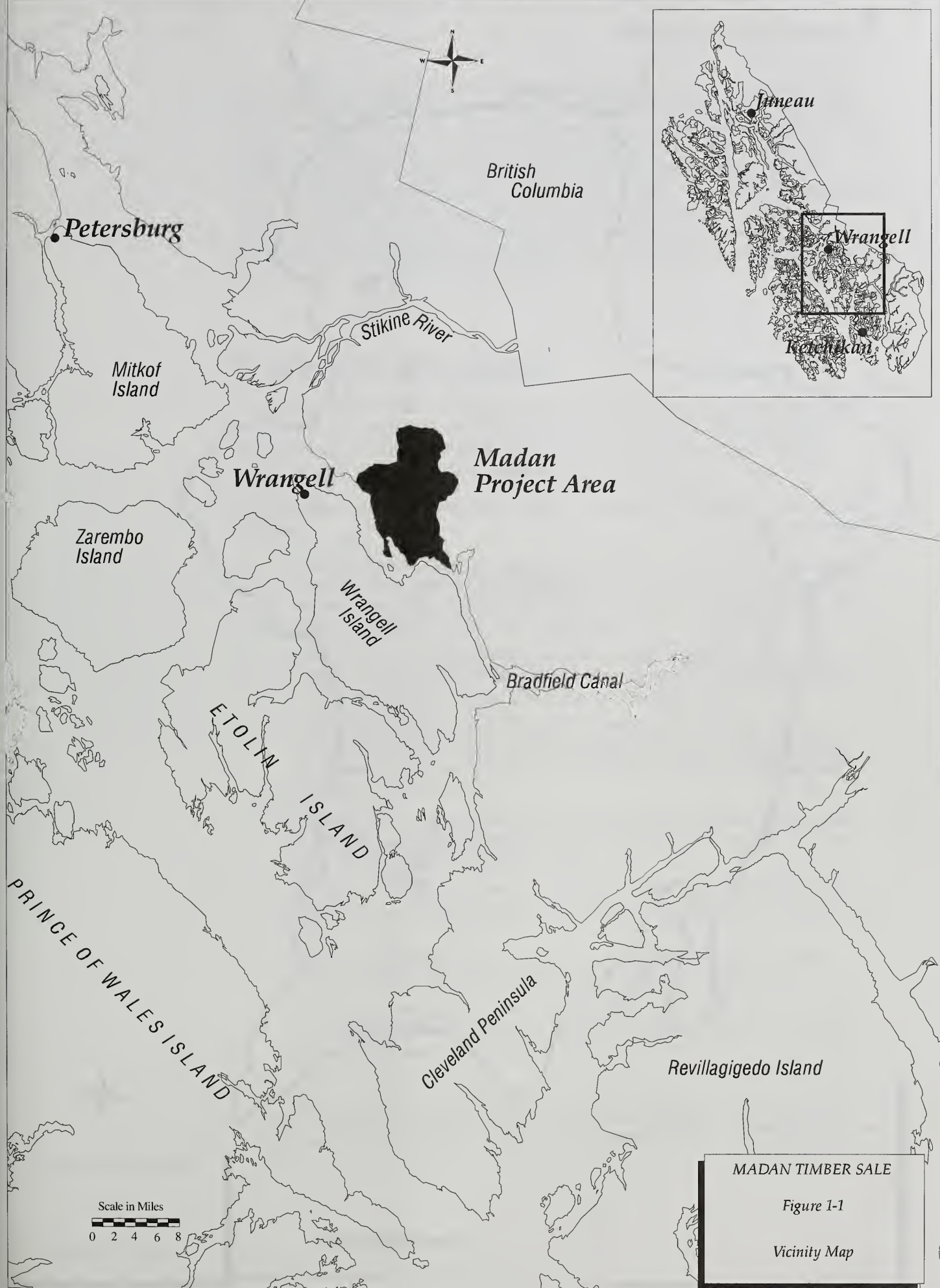
The Project Area is completely unroaded and no LTFs currently exist. It is located within the Madan Inventoried Roadless Area (#204). Past timber harvest has been limited to a 34-acre unit near the mouth of Moose Creek. The saltwater shorelines of the Project Area, as well as its interior, are mostly allocated to the Scenic Viewshed Land Use Designation (LUD). Two small old-growth reserves (OGRs), one north of Virginia Lake and one between Madan Bay and Moose Creek, are also included in the area. Other LUDs in the Project Area include Modified Landscape, Timber Production, and Recreation River. State lands occur along Mill Creek and the nearby shorelines and at the west end of Virginia Lake (Figure 1-2).

## Proposed Action

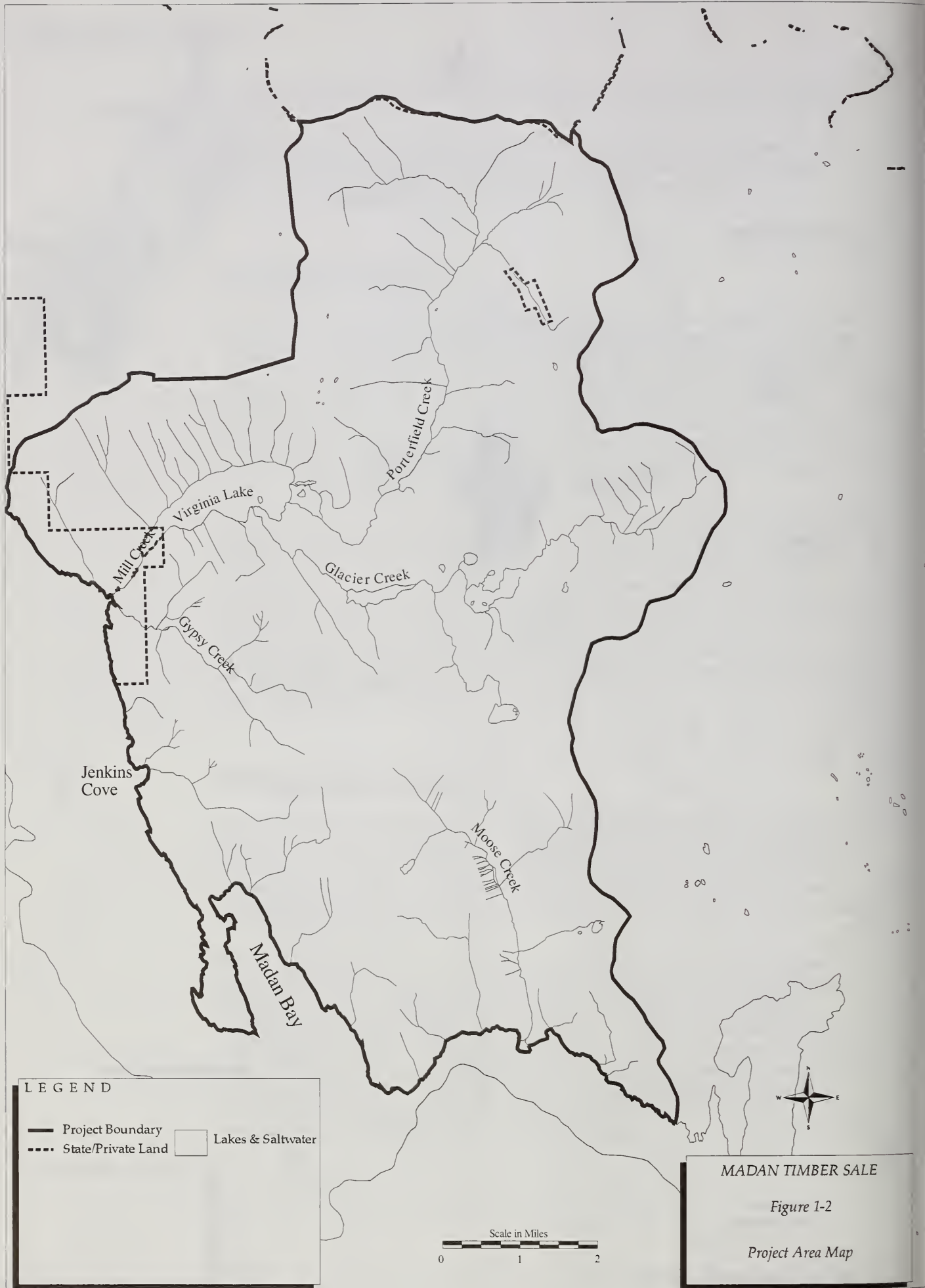
At the start of the planning process, we defined a Proposed Action. This served as a starting point for the planning process, which initially involved identifying significant issues for the project by contacting interested individuals and agencies to determine their concerns. Other alternatives to the Proposed Action were then developed in response to environmental issues, public concerns, and comments from other agencies. This process is described in more detail in Chapter 2.

The original Proposed Action for this project entailed the harvest of about 28 million board feet (MMBF) of sawlog and utility timber on approximately 1,900 acres in VCUs 502 and 504. This has been refined into Alternative 2, which proposes to harvest approximately 32 MMBF on approximately 2,105 acres. Both helicopter and cable (or other ground-based) logging systems would be used, as would both clearcutting with reserve trees and partial cutting. Approximately 15 miles of road would be constructed in the Gypsy Creek, Glacier Creek, Jenkins Cove, and adjacent drainages, and 6 miles of road would be constructed in the Moose Creek drainage. Two LTFs would be constructed, one at Jenkins Cove and one at Moose Creek.









The Proposed Action, as well as the other action alternatives, include a non-significant amendment to the Forest Plan to increase the size of the two OGRs in the Project Area. These changes would make the OGRs consistent with the Forest Plan in terms of size and amount of productive old-growth forest. In VCU 504, the Madan OGR would be increased by adding the area along Madan Bay, which is currently designated Scenic Viewshed LUD. The change would increase the size of the reserve by approximately 905 acres. In VCU 502, the Virginia Lake OGR would be increased by adding the lower reaches of Porterfield and Glacier Creeks, which is currently designated Scenic Viewshed and Recreation River management prescriptions. The change would increase the size of the reserve by approximately 3,655 acres.

## Purpose and Need

The purpose and need for the Proposed Action is to respond to the goals and objectives identified by the Forest Plan for the timber resource while moving the Project Area towards the desired future condition for all resources. The reasons for scheduling a timber sale in this area at this time are discussed in Appendix A.

The following Forest Plan goals and objectives are considered applicable to this project proposal:

1. Manage the Tongass timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner (USDA Forest Service, 1997a: page 2-4).
2. Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber and the demand for the planning cycle (USDA Forest Service, 1997a: pages 2-4, 3-126, 3-135, and 3-144).
3. Recognize the scenic values of suitable timber lands viewed from selected popular roads, trails, water travel routes, recreation sites, bays and anchorages, and modify timber harvest practices accordingly (USDA Forest Service, 1997a: pages 3-126 and 3-135).
4. Maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs (USDA Forest Service, 1997a: pages 3-135 and 3-144).
5. Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska (USDA Forest Service, 1997a: page 2-3).
6. Support a wide range of natural-resource employment opportunities within Southeast Alaska communities (USDA Forest Service, 1997a: page 2-3).
7. Maintain a Forest-wide system of old-growth forest habitat to sustain old-growth associated species, and ensure that the reserve system meets the minimum size, spacing, and composition criteria (USDA Forest Service, 1997a: page 2-2 and Appendix K).

A preliminary analysis suggests that to achieve these goals, while meeting Forest Plan standards and guidelines, approximately 19 to 32 MMBF of timber could be harvested from approximately 1,350 to 2,100 acres.

# 1 Purpose and Need

## The Decision-Making Process

National Forest planning takes place at several levels. The decision making begins with long-range planning at the national level, continuing down through the regional and forest levels to the project level. The Madan Project is part of this hierarchical planning process. This EIS is a project-level analysis; its scope is confined to issues within the Project Area. It does not attempt to address decisions made at higher levels, such as with the Forest Plan. It does, however, implement direction provided at those higher levels.

## Relationship to the Forest Plan

The National Forest Management Act (NFMA) directs each National Forest to prepare an overall plan of activities. The Forest Plan provides land and resource management direction for the Tongass National Forest by establishing LUDs to guide management of the land for certain uses. LUDs describe the activities that may be authorized within VCU; VCUs generally subdivide the LUDs into logical analysis units.

The Forest Plan also guides all natural resource management activities by establishing Forest-wide standards and guidelines. These standards and guidelines apply to all or most areas of the Tongass National Forest and are used in conjunction with the management prescriptions for each LUD.

For the Tongass National Forest, the current Forest Plan is the 1997 Forest Plan Revision (USDA Forest Service, 1997a), as modified since 1997 by non-significant amendments. In 1999, the Deputy Under Secretary of Agriculture, James Lyons, signed a new ROD for the Tongass Forest Plan. This ROD contained modifications to the 1997 Forest Plan and became effective on October 1, 1999. However, in *AFA v. USDA* (J99-0013 CV (JKS)), the U.S. District Court, District of Alaska vacated the 1999 ROD for the Tongass Forest Plan and upheld the 1997 ROD. The Madan EIS tiers to the Forest Plan EIS (USDA Forest Service, 1997b) and the Forest Plan SEIS (USDA Forest Service 2003) and, in some instances, incorporates documented analysis from the Forest Plan EIS and SEIS by reference (40 CFR 1502.21) rather than by repetition.

## Decision to be Made

The current Forest Plan identifies that timber harvest is an appropriate activity in the Project Area. The Tongass Forest Supervisor will decide: (1) if, where, and how much timber harvest should occur in the Project Area at this time; and if so, (2) if, where, and how much road and LTF development should occur to facilitate harvest; (3) if and how to modify the boundaries of the two Project Area OGRs; and (4) what mitigation measures and monitoring would be implemented.



# Forest Plan Direction for the Project

## Land Use Designations and Standards and Guidelines

Forest Plan direction for the Madan project establishes boundaries for project planning. This direction is embodied in the management prescriptions identified for each LUD in the Project Area and in the Forest-wide standards and guidelines.

The Forest Plan designates areas appropriate for various activities through the use of 19 LUDs. These LUDs include management objectives and specific standards and guidelines designed to ensure attainment of those objectives. Standards and guidelines take precedence over annual targets or projected outputs; no project will be funded for which the standards and guidelines cannot be implemented. The Forest Plan LUDs in the Project Area are described below and shown with reference to the VCUs in Figure 1-3. Table 1-1 displays the area of each LUD in the Project Area.

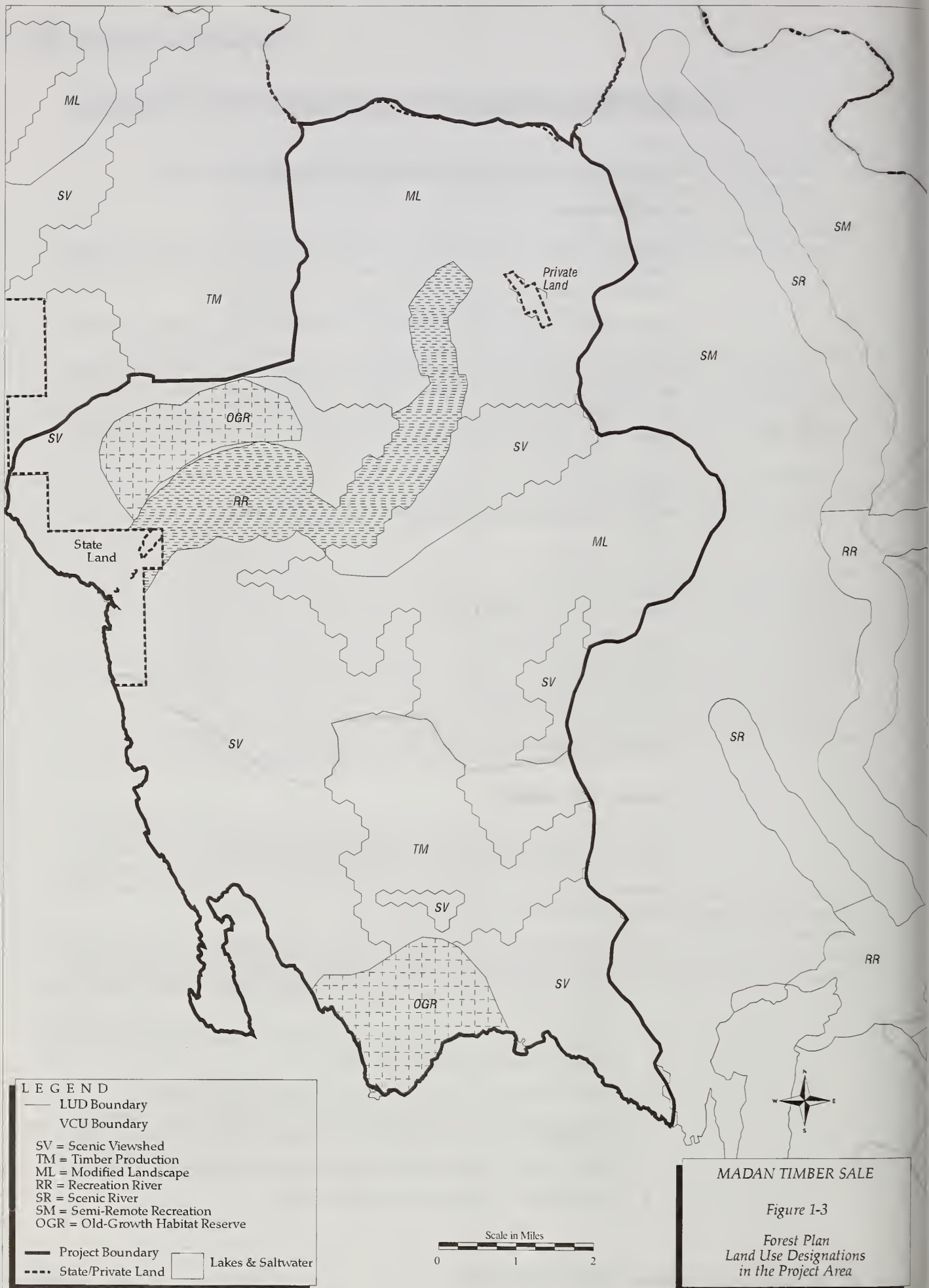
**Table 1-1.**  
**Land Use Designation (LUD) Areas in the Project Area**

LUD	Acres
Scenic Viewshed	16,077
Modified Landscape	16,700
Timber Production	3,615
Old-Growth Habitat Reserves	3,201
Recreational River	3,210
<b>Total National Forest Land</b>	<b>42,803</b>
State/Private	1,376
<b>Total Project Area Land</b>	<b>44,179</b>

### ***Scenic Viewshed***

About 36 percent of the Project Area, including most areas visible from saltwater, are designated as Scenic Viewshed. Timber harvest is proposed for portions of this LUD. Goals in the Forest Plan for management of Scenic Viewshed LUDs are to provide a sustained yield of timber and a mix of resource activities while minimizing the visibility of developments. Objectives include:

- Apply the Visual Quality Objective (VQO) of Retention in the foreground distance zone and Partial Retention in the middleground and background distance zones from Visual Priority Travel Routes and Use Areas. Apply Maximum Modification to all other areas.
- Suitable forest lands are available for timber harvest. Use appropriate silvicultural systems consistent with the adopted VQO.
- Perform viewshed analysis in conjunction with project development.
- Provide a spectrum of recreation and tourism opportunities consistent with the capabilities of the LUD. Semi-primitive to roaded experiences may be offered.
- Provide a transportation network compatible with the characteristic landscape.
- Extend rotations, as necessary, to meet the VQOs.



### ***Modified Landscape***

Most of the higher elevation lands in the northern and eastern portions of the Project Area have a LUD of Modified Landscape (38 percent of the Project Area). Timber harvest is proposed for portions of this LUD. Goals in the Forest Plan for management of Modified Landscape LUDs are to provide a sustained yield of timber and a mix of resource activities while minimizing the visibility of developments in the foreground distance zone. Objectives include:

- Apply the VQO of Partial Retention in the foreground distance zone and Modification in the middleground and background distance zones, as seen from Visual Priority Travel Routes and Use Areas. Apply Maximum Modification to all other areas.
- Suitable forest lands are available for timber harvest. Use appropriate silvicultural systems consistent with the adopted VQO.
- Maintain a spectrum of recreation and tourism opportunities consistent with the capabilities of the LUD. Semi-primitive to roaded experiences may be offered.
- Design roads and associated rock quarries to meet the applicable VQO.

### ***Timber Production***

The Timber Production LUD makes up about 8 percent of the Project Area. This LUD is mostly an inland block in the southern half of the Project Area. Timber harvest is proposed for portions of this LUD. Goals in the Forest Plan for management of Timber Production LUDs emphasize sustained, long-term timber production. Objectives include:

- Apply the VQO of Modification in the foreground distance zone from Visual Priority Travel Routes and Use Areas. Apply Maximum Modification to all other areas.
- Locate and design timber harvest activities primarily to meet timber objectives, but seek to reduce clearcutting when other cutting methods will meet land management objectives. Clearcutting may be used when the topography and stand characteristics do not facilitate other cutting methods.
- Maintain a spectrum of recreation and tourism opportunities consistent with the capabilities of the LUD and compatible with timber production objectives.
- Plan a transportation network of roads and helicopter access that will eventually access most of the suitable timber lands for standard logging or helicopter yarding systems.

### ***Old-Growth Habitat***

The Project Area includes two areas of Old-Growth Habitat LUD, which represent small OGRs; together, these cover about 7 percent of the Project Area, and are referred to as the Virginia Lake and Madan OGRs. No road construction or timber harvest units are proposed under any alternative within the Old-Growth Habitat LUD. The goals in the Forest Plan for management of Old-Growth Habitat LUDs are to maintain old-growth forest and their associated ecological processes to provide habitat for old-growth associated species. Objectives include:

- Provide old-growth forests habitats, in combination with other LUDs, to maintain viable populations of native and desired non-native fish and wildlife species that may be associated with old-growth species.



# 1 Purpose and Need

- Contribute to habitat capability of fish and wildlife resources to support sustainable human subsistence and recreational uses.
- Maintain biodiversity and ecological processes associated with old-growth forests.
- Allow previously harvested conifer stands to develop naturally to old-growth forest habitats or apply silvicultural prescriptions to accelerate forest succession.
- To the extent feasible, limit roads and permitted uses to those compatible with Old-Growth Habitat management objectives.

## ***Recreational River***

The Recreational River LUD occupies 7 percent of the Project Area along Virginia Lake and Porterfield Creek. The Virginia Lake/Porterfield Creek system is to be recommended for Recreational River status under the Wild and Scenic Rivers Act (P.L. 90-542); but it has not been so designated by Congress. According to the Forest Plan ROD (1997), the Virginia Lake/Porterfield Creek system has high recreation values. A readily accessible and barrier-free public recreation cabin is located at the upper end of the lake. Recreation activities include fishing for trophy-size cutthroat trout and wildlife viewing. Also, ongoing fishery habitat improvements have increased the potential of the lake for sockeye spawning. This lake/stream system meets the guidelines for scenic classification but is more suitable for recreational designation, which maintains the potential for mineral development and road construction options. No timber harvest or road construction is proposed for this LUD. Goals in the Forest Plan for management of Recreational River LUDs along recommended Recreational River segments are to maintain their outstandingly remarkable values and classification eligibility until Congress designates the segments or decides not to designate them. Objectives include:

- Apply the Partial Retention VQO to foreground areas seen from the river, roads, and recreation facilities, and Modification to all other seen areas.
- Manage to maintain a free-flowing river resource while providing for access and use consistent with the Wild and Scenic Rivers Act and the Alaska National Interest Lands Conservation Act (ANILCA).
- Permit timber harvest on suitable timber lands if adjacent lands are being managed for that purpose.
- Manage recreation use and activities to meet the levels of social encounters, on-site developments, methods of access, and visitor impacts indicated for the desired Recreation Opportunity Spectrum (ROS) class – generally Roaded Natural. The Roaded Natural ROS class would permit roads to access, parallel, or cross the river.

The following standards and guidelines delineate spatial areas not available for programmed timber harvest within the LUDs that are described above; each applies to a specific habitat or ecological component. More detailed information about these and other standards and guidelines can be found in Chapter 4 of the Forest Plan.

## ***Beach and Estuary Fringe***

The beach and estuary fringe is an area of approximately 1,000 feet inland from mean high tide around all marine coastlines. Programmed timber harvest is not allowed and roads are located outside the fringe when possible.

***Riparian***

Riparian Management Areas are areas of special concern to fish, other aquatic resources, and wildlife. These areas are delineated according to the process group direction in the Riparian Forest-wide Standards and Guidelines (Forest Plan, pages 4-56 to 4-73). Some riparian boundaries may be adjusted after completion of a project-specific watershed analysis (Forest Plan, page 4-56 and Appendix J). Timber harvest is not scheduled in Riparian Management Areas.

***Karst***

High Vulnerability Karst are areas of very high significance and sensitivity from a karst conservation perspective. These areas will be managed to ensure conservation of karst values. Karst lands found to be of high vulnerability will be identified and removed from the suitable land base of commercial forest lands.

***Slopes Greater than 72 Percent***

At the Forest Plan level, slope gradients of 72 percent or more are removed from the tentatively suitable timber base because of the high risk of soil mass movement and accelerated erosion of Class IV channel systems.

## Desired Future Condition

The Forest Plan describes the following desired condition for the Scenic Viewshed LUD, which covers most of the area to be harvested and roaded under this Project:



In areas managed under the Scenic Viewshed LUD, forest visitors, recreationists, and others using identified popular travel routes and use areas will view a natural appearing landscape. Management activities in the foreground will not be evident to the casual observer, and activities in the middleground and background will be subordinate to the characteristic landscape. Areas topographically screened from Visual Priority Travel Routes and Use Areas may be heavily modified. Within these viewsheds, timber harvest units are typically small and affect only a small percentage of the seen area. At any given point in time, roads, facilities, and other structures are either not visually evident or are subordinate to the landscape. A variety of successional stages providing wildlife habitat occur, although late successional stages predominate. Recreation and tourism opportunities in a range of settings are available. In the areas managed for Retention or Partial Retention VQOs, timber yields will generally be obtained through the use of small openings or uneven-aged systems. A yield of timber is produced that contributes to Forest-wide sustained yield.

The desired conditions described by the Forest Plan provide a basis for management of the Project Area. Management activities will also be influenced by Forest Plan standards and guidelines (USDA Forest Service, 1997a) and circumstances specific to the Project Area. Those circumstances include the Recreational River LUD and the two small OGRs in the Project Area.

## Public Involvement

When a timber sale project begins, a group of professionals with a variety of educational backgrounds are designated as an interdisciplinary team (IDT). The Madan IDT listened to public comment and worked with the public and various state and federal agencies in an effort to plan the best possible project. The IDT conducted the planning process and prepared this document to inform the public and the Forest Supervisor of the environmental consequences of the Proposed Action and the alternatives.

## Public Scoping and Involvement

“Public scoping” is the term used to describe the process of identifying the significant issues for a project by contacting interested individuals and agencies to determine their concerns. The following is a summary of the letters, contacts, and meetings that took place during the planning of this project.

- January 1998: Agency scoping meeting held in Juneau, Alaska.
- April 1998: Scoping Letter sent out to identify issues.
- October 1998: Notice of Intent to prepare an EIS published in the Federal Register.
- October 1998: Second scoping/update letter sent out.
- October 1998: Second agency scoping/update meeting held in Juneau, Alaska.
- November 1998: Public Open House held in Wrangell, Alaska.
- April 1999: Meeting with Wrangell Cooperative Association, a federally recognized tribal government.
- A number of interagency review meetings were held for the purpose of reviewing and refining the location and size of the two Project Area small old growth reserves.
- A number of additional smaller meetings held with individuals, agencies, and organizations including the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS), and the Wrangell Indian Resource Association.
- The Draft EIS issued in May 2000 for a 45-day review period. Copies were sent to interested persons, organizations, and agencies.
- Thirteen comment letters on the Draft EIS were received primarily in July 2000 (see Appendix H).
- A subsistence hearing to satisfy ANILCA Section 810 was held in Wrangell, Alaska on March 14, 2003.



## Issues

Although there are often many potential issues and concerns associated with the planning of a timber sale, NEPA directs us to analyze in detail those issues that are significant. This ensures that the analysis and documentation are focused primarily on the issues that are most important to the specific Project Area and the decision to be made. Planning documents for other projects in the area were reviewed and comments made during the public participation process were listened to. A cross-section of these comments is included in the margin adjacent to each issue. This information, plus our knowledge of the Project Area derived from field studies, was used to identify five key issues, which form the basis for the analysis of alternatives. These key issues are discussed in the following paragraphs. Other concerns are listed under Other Environmental Considerations, discussed in the Resource Reports, and summarized in Chapter 3.

Virginia Lake "...is a special place close to town with scenic, recreational and wild values. All logging and road construction should be kept out of the Virginia Lake watershed."

Because of past and future logging on State and private land along the Back Channel "...the Forest Service probably shouldn't harvest any trees...in order to balance the impact on the viewshed..."

"...provide the maximum environmentally feasible and economically harvestable volume from each NEPA project."

"The proposed sale, with its proximity to Wrangell is particularly attractive as it should mean that the log transportation costs will be kept to a minimum making the sale more economically viable."

"The sale areas substantial brown bear populations would be significantly impacted by logging operations, and the increased access logging roads would provide hunters."

### ***Issue 1: Scenic Quality and Recreation Values***

There is concern about how this sale will affect scenic quality. The viewpoints of most concern are the saltwater route along the Eastern Passage (Back Channel) and the Virginia Lake Cabin; views from the Wrangell Island road system are also a concern. From a recreational standpoint, Virginia Lake is the most heavily used location in the Project Area. It is a popular destination for hunting, fishing, and general recreation because of its resource values, proximity to Wrangell, and the availability of a public recreation cabin and boat. Mixed feedback on Virginia Lake was received. Some feel that the area surrounding Virginia Lake should be left alone, while others feel that some development is acceptable to contribute to the timber industry and the timber-dependent economy. Likewise, people voiced concern about impacting the scenery along the Eastern Passage, in light of existing harvest on state and federal lands along the route. Some felt that development was acceptable, while others did not want to add to the impacts.

### ***Issue 2: Timber Management and Economics***

The potential for the project to affect employment and the economy of local communities was brought up as an issue during public scoping. There was much concern regarding the economic viability and amount of volume in the planned sale. Public comments indicated concern about current changes in the timber industry and question the need for this sale in light of the perceived market decline. Comments ranged from voicing strong support for harvesting timber in the Project Area to questioning the need for the sale given recent mill closures in the area. The amount of wood harvested and any infrastructure developed with this entry may affect the amount of available timber and costs associated with future entries for timber harvest. Roads constructed for timber harvest may make future sales more economical, but the access they provide between sales is a concern because of other issues, such as increased vulnerability of wildlife to hunting and other disturbances.

### ***Issue 3: Wildlife Habitat and Species of Concern***

The Forest Plan conservation biology strategy includes two basic components: a system of OGRs and management of the matrix, which includes the land in development LUDs. The location, size, and quality of habitat within the OGRs and the corridors connecting them are key parts of the strategy. The Forest Plan directs the Forest Service to evaluate whether each OGR meets size and specified habitat quality criteria on a project level. The two existing Project Area OGRs do not meet the Forest Plan criteria for amount of productive old growth and/or total size.

# 1 Purpose and Need

"The area for this sale is the most critical winter range for "main land" Sitka Black-tail (deer) in the Wrangell area."

"The roads proposed for the project will allow more and greater opportunities for hunting, camping, and other forms of recreation."

"...seriously consider an alternative which uses selection logging methods and helicopter transfer to barge with no new road building"

"...especially opposed to any road building in the sale area."

The location, density, and use of roads have an effect on the quality of wildlife habitat for certain species, including wolves and brown bears. Roads on the mainland can provide human access to interior game animals that are currently only accessed from shore. Portions of the area provide high quality deer winter range.

## ***Issue 4: Road Access Management***

Numerous public concerns were received which questioned road building, location, design, management, and maintenance. Both the direct and indirect effects of road building on wildlife, water, soils, visual quality, and recreation were a concern. Roads can result in increased hunting pressure on wildlife. Some commentators considered this a positive effect while others considered it a negative effect. Some looked forward to increased opportunity to hunt because of the improved access, while others thought that the nature of the hunting experience would be degraded because more area would be roaded. Part of this issue is whether or not roads, if constructed, should be managed as open or closed to provide local recreational access to the National Forest.

## ***Issue 5: Madan Inventoried Roadless Area***

The Project Area is a part of a vast mainland area, which has no previous road development. This large geographic area extends to and beyond the Stikine River in the north and the Bradfield canal in the south, is currently unroaded, and consists of several Inventoried Roadless Areas. Much of this area will remain unroaded under the current Forest Plan designations. Of this larger geographic area, 154,084 acres (70 percent of the total land in this area) are designated non-development LUDs, such as wilderness, remote, or semi-remote recreation. In these LUDs, road development is not foreseeable at any time in the future and is normally not permitted under the Forest Plan.

All of the Project Area is contained within the Madan Roadless Area (Inventoried Roadless Area #204). The Forest Plan has assigned various LUDs to this area that would allow varying amounts of development. The proposed action would result in development of roads and harvest units within a portion of the roadless area, in a manner that is consistent with the Forest Plan.

The Forest Service recently completed an evaluation of inventoried roadless areas across the country. The evaluation resulted in the issuance of a Roadless Area Conservation Rule, which requires a special evaluation and approval for any road construction within inventoried roadless areas. Although the Madan project and certain other projects that had been initiated were exempted from these requirements, there is concern over road development within this roadless area and the effects this would have on the social and ecological values associated with roadless areas. In addition, the Forest Service has recently completed an evaluation of roadless areas (throughout the Tongass) for wilderness recommendations. This evaluation includes the Madan Inventoried Roadless Area and was published in a separate Supplemental EIS (USDA Forest Service, 2003).

## **Other Environmental Considerations**

Other resource concerns are important, but were not used to drive alternative development. These resources are protected to such a degree by the Forest Plan standards and guidelines, and by other laws and constraints, that the effects from each of the alternatives are not significant. A more detailed discussion of these important resources



and their protection measures can be found in the Resource Reports and is summarized in Chapter 3.

Issues considered as part of this analysis, which do not appear to be significant, include:

- Air Quality
- Minerals, Karst, and Soils
- Water Quality
- Fish Habitat
- Marine Resources
- Wetlands
- Vegetation
- Heritage and Archeological Resources
- Subsistence
- Effects on Consumers, Civil Rights, and Women

These issues are summarized in Chapter 3. In addition, the following individual Resource Reports were prepared for the project and provide more detail:

- Geology, Minerals, and Karst
- Soils
- Watershed and Fisheries
- Timber/Silviculture
- Wetlands and Threatened, Endangered, and Sensitive (TES) Plants
- Wildlife
- Logging System and Transportation Analysis and Timber Economics
- Cultural Resource Survey
- Recreation, Scenery, and Lands
- Subsistence
- Community Profiles and Socioeconomics

## Other Agency Involvement - Permits, Licenses, and Certifications

Several other agencies reviewed this project and provided their professional input on topics in which they have expertise. In some cases, reviews are necessary because another agency has authority to issue permits for a specific proposed activity. This relationship to other agencies in the planning of this project is described below.

### *U.S. Army Corps of Engineers*

The U.S. Army Corps of Engineers (Corps) is responsible for approving proposals to dredge or place fill materials in the coastal waters of the United States under Section 404 of the Clean Water Act. The Corps also has administrative authority over activities associated with wetlands. Any road construction in wetlands is of interest to the Corps;



# 1 Purpose and Need

therefore, effects on those areas must be considered and reduced. All roads and associated facilities proposed for this project are for the primary purpose of managing the timber resource.

## *U.S. Environmental Protection Agency*

The U.S. Environmental Protection Agency (EPA) provides a general review in accordance with their responsibilities under NEPA, Section 309 of the Clean Air Act, and Section 402 of the Clean Water Act. They also administer permits associated with the LTFs under the National Pollution Discharge Elimination System.

## *National Marine Fisheries Service*

The National Marine Fisheries Service (NMFS) has authority for threatened or endangered marine life and for all anadromous salmon. They are currently evaluating Essential Fish Habitat for all salmon, including fresh water salmon. We consult with NMFS on possible effects on those species.

## *U.S. Fish and Wildlife Service*

The USFWS administers the Endangered Species Act (ESA). We consult with the USFWS to determine if the proposed project would affect threatened or endangered species. Effects on other wildlife species are also discussed with the USFWS because they have expertise in many areas and are interested in managing wildlife in ways that will prevent the need for listing species as threatened or endangered in the future.

## *State of Alaska*

Five departments in the State of Alaska were asked to participate in the planning of this project. They provided general comments and suggestions, as well as specific reviews. These departments include:

1. Division of Governmental Coordination (DGC)—Formerly provided overall coordination for the State's comments and administered the Alaska Coastal Management Program (ACMP) which requires the Forest Service to design activities compatible with approved State management guidelines. The Division of Governmental Coordination was abolished in 2003, and the Office of Project Management and Permitting (OPMP) now conducts ACMP review, within the Department of Natural Resources.
2. Alaska Department of Environmental Conservation (ADEC)—Participates in cooperative water quality management through Section 319 of the Clean Water Act and a Memorandum of Agreement with the Forest Service. ADEC also issues a certificate of compliance with Alaska Water Quality Standards under Section 401 of the Clean Water Act.
3. Alaska Department of Fish and Game (ADF&G)—Involved in the Coastal Zone Consistency review and is especially interested in instream activities and other fish, water, wildlife, and subsistence issues.

4. Alaska Department of Natural Resources (ADNR)—Tideland permit and lease or easement necessary for the log transfer site.
5. State Historic Preservation Office (SHPO)—Compliance with Section 106 of the National Historic Preservation Act (NHPA), a process to determine the effects of alternatives on heritage resources.

## ***Wrangell Cooperative Association***

The Wrangell Cooperative Association is a federally recognized tribal government, and we consult with them on possible cultural resource impacts, as well as other resource impacts from the project.

## **Legislation and Executive Orders Related to this EIS**

A brief list of laws pertaining to preparation of EISs on federal lands is shown below. Some of these laws are specific to Alaska, while others pertain to all federal lands.

- Multiple Use Sustained Yield Act of 1960
- National Historic Preservation Act (NHPA) of 1966 (as amended)
- Wild and Scenic Rivers Act of 1968, amended 1986
- National Environmental Policy Act (NEPA) of 1969 (as amended)
- Clean Air Act of 1970 (as amended)
- Alaska Native Claims Settlement Act (ANCSA) of 1971
- Marine Mammal Protection Act of 1972
- Endangered Species Act (ESA) of 1973 (as amended)
- Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended)
- National Forest Management Act (NFMA) of 1976 (as amended)
- Clean Water Act of 1977 (as amended)
- Rivers and Harbors Act of 1899 (Section 10)
- American Indian Religious Freedom Act of 1978
- Alaska National Interest Lands Conservation Act (ANILCA) of 1980
- Archeological Resource Protection Act of 1980
- Cave Resource Protection Act of 1988
- Tongass Timber Reform Act (TTRA) of 1990
- Magnuson-Stevens Fishery Conservation and Management Act of 1996
- Executive Order 11988 (floodplains)
- Executive Order 11990 (wetlands)
- Executive Order 11593 (heritage)
- Executive Order 12898 (environmental justice)
- Executive Order 12962 (aquatic systems and recreational fisheries)

# 1 Purpose and Need

In addition, the Coastal Zone Management Act (CZMA) of 1976, as amended, pertains to the preparation of this EIS. Federal lands are not included in the definition of the coastal zone as prescribed in the CZMA. The CZMA, however, requires that when federal agencies conduct activities or developments that affect the coastal zone, that agency's activities or developments must be consistent to the maximum extent practicable with the approved State Coastal Management Program. The Forest Service makes this determination.

The ACMP incorporated the Alaska Forest Resources and Practices Act of 1979 as applied standards and guidelines for timber harvesting and processing. The Forest Service standards and guidelines and mitigation measures described in Chapter 2 of this document equal or exceed State standards.

A Civil Rights Impact Analysis (CRIA) is included as part of this EIS. The purpose of the CRIA is to identify any possible impacts associated with this proposed project based on an individual's civil rights (race, color, national origin, age, religion, gender, disability, political beliefs, sexual orientation, marital or family status). If you feel this project will impact your civil rights, please let us know.

## Availability of the Planning Record

An important consideration in the preparation of this EIS has been the reduction of paperwork as specified in 40 CFR 1500.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated.

The planning record is a comprehensive project file documenting the process of developing this EIS, and is located through the Wrangell Ranger District Office in Wrangell, Alaska. Other reference documents such as the Forest Plan, the TTRA, the RPA, and FSM 2410 R10 Supplement 2400-2002-1 are available at public libraries around the region or at the Forest Supervisor's Offices in Petersburg, Sitka, and Ketchikan, Alaska. The Forest Plan ROD and other recent EISs are also available on the Internet and on CD-ROM.





# CHAPTER 2

## ALTERNATIVES

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# CHAPTER 1

## Introduction



Figure 1.1: A diagram illustrating the concept of a function.

Figure 1.1

Figure 1.2: A diagram illustrating the concept of a function.

# CHAPTER 2

## ALTERNATIVES

### Introduction

This chapter describes the alternatives under consideration in this EIS and discusses the process followed to develop the alternatives. It also describes the field studies conducted, the alternatives considered, but not in detail, and identifies the proposed mitigation measures. At the end of the chapter, a comparison of the alternatives is provided.

### Field Studies

Field studies were conducted in 1997 and 1998 to collect specific information relative to issues and to verify resource information contained in the Tongass National Forest geographic information system (GIS); additional field verification activities were conducted in 1999 and 2000. Resource information maintained in the GIS includes streams, important wildlife habitat, timber and soil inventories, and locations of proposed harvest units. Specific studies included silvicultural stand exams, goshawk and marbled murrelet surveys, deer winter range assessments, stream electrofishing for fish presence/absence, and others. Unit and road cards were used to document the locations and resource concerns regarding possible harvest units and roads. Resource specialists listed specific concerns on the cards and gave recommendations for addressing or mitigating those concerns (see Appendices B and C). Information from field studies and GIS was then used to assess the issues, develop alternatives, and analyze the environmental effects of each alternative.

Inventories, resource specialist reports, and GIS information are part of the Madan Timber Sale planning record. Also included in the planning record are the results of public scoping and the unit and road design cards. The planning record is available for public inspection through the Wrangell Ranger District office in Wrangell, Alaska.

### Alternative Development

An alternative is a set of activities designed to accomplish the goals described in the Purpose and Need section of Chapter 1. The Proposed Action (Alternative 2) is one of many possible approaches to accomplishing these goals by harvesting timber in the Project Area, and was developed during the early planning phase of this project. The planning phase included completing a logging system and transportation analysis (LSTA) for the Project Area. During this analysis, the suitable timber in the Project Area was divided into logical harvest units called the unit pool. In addition, the roads needed to





## 2 Alternatives

### Road Management Options

- Road Storage
- Decommissioned or Closed (ADNR definition)
- Maintenance

### Road Storage

Process of putting a road into a closed condition which protects resources including soils, water quality, fisheries, and wildlife. These roads may be left in this condition for many years. The road remains on the forest road transportation inventory and will be reopened at a future date.

#### Three Steps of Storage:

1. Establishing drainages across the roadway that are self-maintaining and that effectively prevent erosion.
2. Removing culverts and bridges and reestablishing the natural drainage patterns of streams and bypassing ditch relief culverts with waterbars.
3. Returning the roadway to resource production through natural or planted vegetation (grass, browse, or trees).

**Maintenance:** Maintaining the road to the standard assigned for the maintenance level of the road.

**Stormproofing:** Leaving drainage structures in place, but providing waterbars, rolling dips, outslopes, and other features to ensure controlled runoff until any needed maintenance can be performed on the primary drainage system.

access the unit pool were mapped. These units and the roads were surveyed in 1997 and 1998. During this fieldwork, the shape of units and the locations of roads were modified to reflect on-the-ground conditions, and a number of units and roads were dropped because they were determined to be inconsistent with the Forest Plan. All unit modifications were documented in a section on the unit cards titled "Unit Development" (Appendix B). Many of the reasons for road locations are also included on the Road Cards (Appendix C). Information on LTF design and development is presented in Appendix D.

A group of resource specialists, known as the IDT, designed alternatives to the Proposed Action to provide different approaches for meeting the purpose and need. These alternatives were designed to address the issues identified during scoping (see Chapter 1), and were also designed to meet Forest Plan standards and guidelines (USDA Forest Service, 1997a) and applicable laws.

The original alternatives were refined over succeeding months to broaden the range of issues they addressed. As a result, a number of the original alternatives were dropped from detailed analysis because they fell within the range of the alternatives considered in detail (see below).

Various combinations of elements in Alternatives 1 through 5 are possible. The alternatives presented in this document are intended to provide a reasonable range of options in order to achieve the purpose and need of the project. Within this range, various combinations of alternatives can be considered in determining the selected alternative.

## Forest Plan Consistency

The alternatives incorporate all applicable management direction from the 1997 Forest Plan, as modified by non-significant amendments made since 1997, and are fully consistent with its goals and objectives, standards and guidelines, and management area prescriptions as they apply to the Project Area.

## Alternatives Considered in Detail

### Items Common to All Action Alternatives

#### Access Management

Two access options are being considered under each of the action alternatives (see Appendix F [Appendix Table F-1] for a detailed listing of the maintenance and traffic management strategy proposed for each road segment under each option). Under Option A, most roads would be left open after harvest and stormproofed (see sidebar). There would also be selective road closures for short segments of the system. These roads would be placed in storage with the drainage structures removed. Under Option B, most roads would be closed after harvest, either by barrier berms or by placing the road in

storage. Roads closed by berms would be stormproofed by providing driveable waterbars/rolling dips where necessary. Storage results in maintaining roads to *protect* improvements and resource values only (see sidebar).

### ***Logging Camps***

No land-based logging camps would be authorized for this timber sale. The purchaser may use a floating camp, which would be subject to state and federal permits and would operate only during project implementation. If used, this camp would most likely be located at Jenkins Cove. If an alternative with roads is selected, there can be some minor land-based facilities, such as a repair shop for trucks and other equipment, and storage facilities for fuel/lubricants or road-building explosives.

### ***Log Transfer Facilities (LTFs)***

One or two LTFs may be built to service the timber sale, depending on the alternative. One would be located at Jenkins Cove and one near the mouth of Moose Creek. At Jenkins Cove, the LTF would be a floating LTF just north of the cove and would include an equipment ramp inside the cove on the north shore. The nature of floating LTFs is such that the log slide is anchored to the mainland and the slide pivots up and down with the tide. The slide is then removed upon completion of the sale. At Moose Creek, the LTF would be a low-angle ramp design LTF and would be located to the west of the mouth of Moose Creek. After the sale, all floating elements of the LTFs would be removed but elements on shore would be maintained for possible future use. The LTFs could be designed to accommodate either watering or barging of logs, allowing flexibility for use of the facility within current environmental standards. In this EIS, the watering of logs was assumed for effects analysis because it would have greater environmental effects compared with barging of logs.

### ***Old-Growth Habitat Reserves (OGRs)***

An Old-Growth Habitat Reserve (OGR) is an area containing a contiguous unit of old-growth habitat to be managed to maintain the integrity of the old-growth forest ecosystem. The Forest Plan created a system of OGRs across the entire Tongass National Forest, consisting of small, medium, and large reserves. The Project Area contains two small OGRs.

The Forest Plan directs that the size and shape of small OGRs should be reviewed and revised, if appropriate, during project evaluations. Based on an evaluation of the Madan Project Area OGRs and their level of compliance with criteria established in the Forest Plan, the size and shape of both OGRs in the Project Area are proposed for revision in each of the action alternatives. The evaluation and design of both OGRs were conducted with the assistance of and in cooperation with the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service. The existing OGR boundaries would be retained under the No-Action Alternative.

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### ***Silvicultural Prescriptions***

The harvest units in each of the action alternatives would be harvested following one of four general prescriptions listed below. Each prescription incorporates reserve trees to varying degrees.

**Clearcut with Minimum 10 Percent Retention** – Up to 90 percent of the merchantable volume would be harvested; a minimum of 10 percent of the merchantable volume would be retained in clumps or along setting boundaries. Note that the percent retention both here and below refers to merchantable trees greater than 9 inches in diameter breast height (dbh). This percent would be in addition to the retention of non-merchantable trees; however, lower quality merchantable trees with high defect may be emphasized for retention, such as mature trees with substantial rot, twist, or other defects, which are often the best trees for wildlife. Only trees with little or no mistletoe would be retained. This prescription is generally used for units that do not have visual, slope stability, or reforestation concerns.

**Patch Cut with Minimum 60 Percent Retention** – This prescription involves creating small openings up to 5 acres in size, scattered throughout the unit. Non-merchantable trees and safe snags (see the reserve tree guidelines in USDA Forest Service, 1993) would be retained in the openings. Approximately 30 percent of the volume in the unit would be targeted for harvest, but harvest may reach 40 percent. This prescription would leave 60 to 70 percent of the volume in merchantable trees greater than 9 inches dbh. The intent is to have three entries over the next 100 to 150 years with about 30 percent harvested during each entry and about 10 percent of the volume remaining as permanent retention. Entries would likely occur 30 to 60 years apart. This prescription is often used for units that have visual, slope stability, or reforestation concerns.

**Group Selection with Minimum 70 Percent Retention** – Groups up to 2 acres in size would be harvested scattered throughout the unit. Approximately 25 percent of the volume would be targeted for harvest, but harvest may reach 30 percent. This would leave 70 to 75 percent of the volume in merchantable trees on site after harvest. Entries would likely occur 30 to 60 years apart. This prescription is often used for units that have visual, slope stability, or reforestation concerns.

**Individual/Group Selection with Minimum 70 Percent Retention** – Individual trees and/or small groups up to 2 acres in size would be harvested, scattered throughout the unit. This prescription may include selection by diameter limits. Approximately 25 percent of the unit would be targeted for harvest, but harvest may reach 30 percent. A variation of this prescription would be used in Units J-5, J-10, and J-13 under Alternative 4. Because these units are largely “not seen,” the minimum retention would be 50 percent and the targeted harvest percentage would be 45 percent. Where individual selection is used, removal of 25 to 30 percent of the volume would likely leave 70 to 75 percent of the existing merchantable trees on site after harvest. Entries will likely occur 30 to 60 years apart. This prescription is often used for units that have visual, slope stability, or reforestation concerns.



## Sort Yards

Two areas for log sorting have been identified; one is on the north side of Jenkins Cove and one is west of the mouth of Moose Creek. Each sort yard would occupy 3 to 4 acres, and at each location, the sort yards would be developed away from the shoreline and out of sight.

## Alternative 1: No Action

Under this alternative, the effects of not harvesting timber or building roads in the Project Area at this time are analyzed. This alternative would respond to the issues of scenic quality, recreation value, the maintenance of existing roadless character, and wildlife habitat protection, including old-growth forests by not building roads or harvesting timber. This alternative, however, would not respond to the issue of providing employment and contributing to the local economy and would not contribute sawtimber or other wood products to meet the annual demand for Tongass National Forest timber from the Project Area, as described in the Purpose and Need (Chapter 1). Under this alternative, the small OGRs, located at Virginia Lake and Madan Bay, would remain as mapped in the Forest Plan.

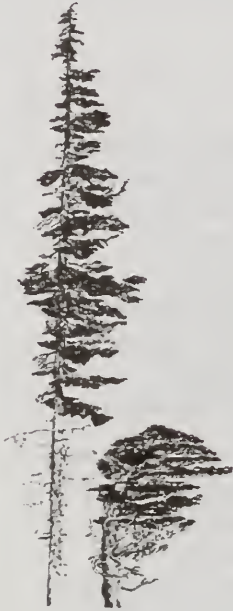
This alternative would not move the Project Area towards the desired future condition described in the Forest Plan (USDA Forest Service, 1997a). The existing condition would continue to be influenced by natural disturbance processes (Figure 2-1). In addition to providing an alternative to the action alternatives, the No-Action Alternative provides a benchmark that allows the decision-maker to compare the magnitude of the environmental effects of the action alternatives with the current condition (CEQ Regulations, Section 1502.14[c]).

## Alternative 2: Proposed Action

This alternative emphasizes economic timber harvest within the constraints of Forest Plan standards and guidelines. Timber volume is maximized to the extent that a reasonable economic timber harvest can be achieved. The Proposed Action includes the harvest of approximately 32 MMBF from approximately 2,105 acres, and involves the development of approximately 21 miles of road, including 3 miles of temporary road. This alternative focuses on establishing the infrastructure in this initial entry for use in subsequent entries (Figure 2-2). It constructs LTFs at Moose Creek and Jenkins Cove, and features timber development within Virginia Lake, Gypsy Creek, Jenkins Cove, and Moose Creek watersheds. The Proposed Action employs a variety of harvest methods including helicopter, live and running skyline, and highlead systems, but generally relies more on conventional silvicultural prescriptions (i.e., clearcuts) with minimum 10 percent volume retention.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of productive old growth (POG), as shown in Figure 2-1, based on recommendations from the IDT and resource agencies. As a result, the total area in OGRs would increase by 4,577 acres.

## 2 Alternatives



### Alternative 3

Alternative 3 reduces road construction and acres of treatment within the Moose Creek watershed and defers road construction and timber harvest entirely within the Virginia Lake watershed. It also reduces road construction within the Jenkins Cove and Gypsy Creek watersheds. Alternative 3 includes the harvest of approximately 19 MMBF from approximately 1,719 acres, and involves the development of approximately 9 miles of road, including 1 mile of temporary road. It retains conventional harvest prescriptions and methods adjacent to the constructed road segments, but proposes non-conventional prescriptions for the majority of the suitable timber within the Jenkins Cove watershed. The management prescriptions include individual/group selection harvest by helicopter with approximately 25 percent stem removal within almost the entire suitable stratum. Two LTFs, one at Jenkins Cove and one at Moose Creek, would still be constructed.

Because of the large amount of selection harvest and the low density of roads, this alternative is the second most responsive to the scenic issue and also addresses the road development/access management and wildlife habitat/species conservation issues. Future road development options and harvest opportunities within the Moose Creek and the Virginia Lake watersheds are retained.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, as shown in Figure 2-3, based on recommendations from the IDT and resource agencies. As a result, the total area in OGRs would increase by 4,577 acres.

### Alternative 4

Alternative 4 emphasizes helicopter harvest and minimizes road construction. This alternative defers all treatment and constructs no roads within the Virginia Lake watershed (as in Alternative 3) and also throughout most of the Gypsy Creek watershed. Within the Jenkins Cove watershed, all harvest would be by individual or group selection. The alternative would construct 0.3 mile of road and a sort yard, and all harvest would be by helicopter with approximately 25 percent stem removal within almost the entire suitable stratum. Stem removal would be increased to 50 percent in Units J-5, J-10, and J-13 because these units are generally not seen. This alternative also includes two barges to provide for more economical helicopter yarding distances; one would be south of Jenkins Cove and one would be at the head of Madan Bay. In these areas, logs would be yarded directly to the barges and limbed. They then would either be loaded onto an adjacent barge for transport, or returned to the LTF for sorting and bundling.

In the Moose Creek drainage, the LTF and transportation system would be fully developed and harvest would be almost at the same level and using the same prescriptions as in Alternative 2. This level of harvest is consistent with the Forest Plan designation of Timber Production in most of this watershed and may be necessary to make this alternative economically viable because of the expected low economics of the Jenkins Cove watershed helicopter harvest.

Alternative 4 includes the harvest of approximately 19 MMBF from approximately 1,769 acres and involves the development of approximately 7 miles of road, including 1 mile of temporary road.

Because of the high proportion of selection harvest and the lack of roads, this alternative is the most responsive to the scenic issue and addresses the road development/access management and wildlife habitat/species conservation issues. Future road development options and harvest opportunities within the Virginia Lake watershed are retained.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, as shown in Figure 2-4, based on recommendations from the IDT and resource agencies. As a result, the total area in OGRs would increase by 4,577 acres.

## **Alternative 5**

Alternative 5 defers all treatment within the Moose Creek watershed in an effort to maintain the integrity of all resource values in this watershed, but maintains future options for harvest and road construction. This alternative treats the Virginia Lake, Gypsy Creek, and Jenkins Cove watersheds at the same level as in Alternative 2. This includes maximum road development and conventional harvest, where practical. It includes the harvest of approximately 21 MMBF from approximately 1,353 acres, and involves the development of approximately 15 miles of road, including 2 miles of temporary road. Only the Jenkins Cove LTF would be developed.

This alternative is responsive to the road development/access management and wildlife habitat/species conservation issues in the Moose Creek watershed. In other areas, it emphasizes economic timber harvest within the constraints of Forest Plan standards and guidelines.

The OGRs located at Virginia Lake and Madan Bay would be modified to make them consistent with the Forest Plan in terms of size and acres of POG, as shown in Figure 2-5, based on recommendations from the IDT and resource agencies. As a result, the total area in OGRs would increase by 4,577 acres.

## **Alternatives Considered But Eliminated From Detailed Study**

### **Full Entry/Limited Road Emphasis**

This alternative was a precursor of Alternative 3, but it would have allowed entry into all areas entered under Alternative 2. It would have limited road construction by allowing only mainline roads and short spurs to be built and avoided construction of higher elevation roads. Higher elevation units would have been harvested by helicopter and most helicopter units under Alternative 2 would have been included. Units near Glacier Creek and the eastern half of Virginia Lake were not included under this alternative. Compared with Alternative 3, this alternative permitted entry into more areas, but did not include as much helicopter harvest in the Jenkins Cove area. This alternative was dropped from detailed study because the issues it addresses and its effects fall within the range of the alternatives considered in detail. In general, its effects would be greater than those of Alternative 3 and less than those of Alternative 2.



## 2 Alternatives

### Visual/Wildlife Emphasis with Roads

This alternative was a precursor of Alternative 4 and would have avoided harvest in areas with the highest visual and wildlife values and in high volume stands, especially those with high deer winter range or goshawk habitat values. It would have also avoided harvest in areas with the highest visual concerns, especially along Virginia Lake and along saltwater shorelines from Madan Bay south. Compared with Alternative 4, it permitted entry into more areas and greater road development, but did not include as much helicopter harvest in the Jenkins Cove area. This alternative was dropped from detailed study because the issues it addresses and its effects fall within the range of the alternatives considered in detail.

### Helicopter Only

A Helicopter Only Alternative would respond to the roadless issues, as well as potential effects upon marine resources associated with constructing Log Transfer Facilities. An all helicopter alternative would avoid the potential effects associated with road construction, including soil displacement. There would be no stream crossing, cable corridors would be avoided, and timber management would be confined to the foreground landscape zone. However, by implementing a helicopter-only alternative, no infrastructure would be developed for potential future entries in the Madan development LUDs and management would only occur within the lower slopes of the project, beyond the 1000-foot beach buffer. As shown below, the expense of helicopter yarding makes a helicopter-only alternative much less viable than the alternatives considered in detail. Alternative 4 does fully consider helicopter-only yarding in the Jenkins Cove portion of the project area, and Alternative 5 fully considers no harvest in the Moose Creek drainage, thus alternatives considered in detail do include the components of a helicopter-only sale in the project area.

The all helicopter alternative considered all harvest units within approximately one mile from saltwater. These units included J-1, J-4, J-5, J-10, J-13, J-30, J-31, J-42, J-49, J-50, J-52, J-53, J-201, J-202, J-203, and J-204. Total projected harvest from these units is approximately 18,139 CCF (9 MMBF). This alternative would include approximately 800 acres of 70 percent retention harvest prescriptions and 225 acres of clearcut with 10 percent retention prescriptions. No roads or LTFs would be developed under this alternative. Due to extremely long flight distances, no units within the Moose Creek drainage were considered for inclusion in a helicopter-only alternative.

To determine the economic viability of this alternative it was analyzed using the NEPA Economic Analysis Tool (NEAT), a spreadsheet model designed to evaluate the economics of proposed timber sales. This analysis resulted in an expected bid value of -\$81.24/CCF under current market conditions. This was substantially lower than the expected bid values identified for the action alternatives, which range from -\$31.87 to -\$54.79/CCF. The results of the NEAT analysis are discussed further in the Timber Management and Economics section in Chapter 3. Because the helicopter-only alternative resulted in an expected bid value of -\$81.24/CCF, and because the components of a helicopter-only alternative are included in Alternatives 4 and 5, it was not considered in detail in the FEIS as a separate alternative.

## LTF-Barge Only

Usually log trucks are used to haul logs over a network of roads from a sale area to the mill or processing facility; however, the Madan project area, like much of the rest of Southeast Alaska, is isolated from any road system that could connect to a mill site. Because of the mix of islands and water in Southeast Alaska, most logs need to be transported by water between the sale area and the mill. There are two ways to transport logs across the water. The most common method in Alaska has been to place bundles of logs in the water tied together to form a raft. Once several rafts have been assembled, a tugboat tows them to the mill or processing facility. An alternative to rafting logs directly in the water is to load them onto a barge, which is then towed to the mill.

The LTF is the location where logs are transferred between a ground-based transportation system of roads and trucks and a water-based transportation system of rafts, barges, and tugboats. There are a number of environmental and economic concerns associated with installation and use of any LTF; these are addressed in Appendix D of this EIS.

Several people asked us to consider a barge-only LTF for this project. An LTF that is designed for direct watering of logs can fairly easily be altered to accommodate barge loading without significant change to the “footprint” or the area impacted. The converse is not true, in that an LTF that is designed to accommodate barge loading would not easily be used for watering of logs. A barge-only facility could be designed with the same or slightly smaller in-water footprint than an LTF that allows watering of logs; however, to make a barge facility workable, a larger upland storage/sort yard would need to be developed close to the LTF where logs could be stockpiled between barge trips. Barging logs could result in less bark and woody debris accumulation in the marine environment. Dive surveys at both Jenkins Cove and Moose Creek indicate there is adequate depth and current at these sites to accommodate watering of logs without significant adverse effects to the marine environment. According to the USFWS, who conducted the dive surveys, neither of the potential LTF sites is situated in an area of high-value marine habitat. Designing the LTFs to accommodate either watering or barging of logs allows the most flexibility for use of the facility within current environmental standards.

For the reasons above, an alternative that provides for barge-only transfer of logs was not developed. The differences in LTF designs are addressed in Appendix D of the EIS.

## Old-Growth Habitat Reserve Alternatives

The Forest Plan provides for further evaluation and possible adjustments to small OGRs. During project planning, the Forest Service IDT biologist worked closely with biologists from ADF&G and the USFWS to evaluate the location and composition of the small OGRs, as mapped by the Forest Plan. Recommendations for revising these OGRs were produced by this group and other biologists, and these were reviewed and discussed at the District Ranger level. These recommendations are included in the action alternatives, which are being analyzed in detail. A number of variations on these recommendations were considered, but these were not analyzed in detail because they did not comply with the letter and intent of the Forest Plan as well as the alternative considered in detail.



## 2 Alternatives

### Best Management Practices

Best Management Practices (BMPs) are practices and operating procedures designed to protect water quality and wetlands. They are the result of extensive efforts between the Forest Service and the State of Alaska to identify practices that will ensure that timber harvest activities minimize soil erosion and protect aquatic habitat.

BMPs are standards to be achieved, not detailed or site-specific prescriptions or solutions. As defined in the USDA Forest Service's Soil and Water Conservation Handbook, BMPs are mandated for use in Region 10 under the Tongass Timber Reform Act.

## Mitigation Measures

The analysis documented in this EIS discloses the possible adverse impacts that may occur as a result of implementing the actions proposed; therefore, measures were formulated to mitigate these impacts. These measures were guided by the Forest Service goals and objectives for the applicable LUDs and follow the Forest Plan standards and guidelines (USDA Forest Service, 1997a).

A variety of site-specific mitigation measures designed primarily to avoid or minimize adverse impacts have been evaluated, and those that are most appropriate have been incorporated into harvest unit and road design. These measures are referenced on the unit cards and road cards (Appendices B and C). Appendix E lists each site-specific mitigation measure and the unit and alternative to which it applies.

In addition to the site-specific measures listed in Appendix D, a variety of general and other site-specific measures would apply to all harvest and construction activities and would be incorporated into the timber harvest unit and road design. These include all appropriate BMPs not specifically identified below. Direction for use of BMPs on National Forest System lands in Alaska is included in Chapter 10 of Forest Service Handbook (FSH) 2509.22, Region 10 Soil and Water Conservation Handbook (USDA Forest Service, 1991c). The handbook describes the application, monitoring, evaluation, and refinement of these BMPs. Appendix C of the Forest Plan (USDA Forest Service, 1997a) provides a list and brief summary of the BMPs used in Region 10. Many other Forest Plan standards and guidelines apply in addition to those cited below. These standards and guidelines, including Appendix C of the Forest Plan, are incorporated by reference (USDA Forest Service 1997a and 1997b).

## General Mitigation Measures

These general mitigation measures apply to all units and roads in the Project Area. They may also apply to other portions of the Project Area. The source(s) of each general measure are listed after the measure in terms of individual Forest Plan standards and guidelines (see Chapter 4 of the Forest Plan) or BMPs (see Appendix C of the Forest Plan and Chapter 10 of FSH 2509.22, Region 10 Soil and Water Conservation Handbook). Specific mitigation measures that are applied to selected units and/or roads in a project are identified in Appendix E.

**Air Quality Protection:** Design projects to control air pollution impacts and to ensure that the predicted emissions from all pollution sources do not exceed ambient air quality standards, as specified under the Alaska Administration Code, Title 18, Chapter 50; applicable permits will be obtained from ADEC for all projects. (AIR 112)

**Soil/Water Protection During Timber Sale Planning:** Incorporate soil and water resource considerations into timber sale planning. Include site-specific considerations: site preparation; designating water quality protection needs on sale area maps; locating and designing landings for good drainage and dispersion of water; incorporating erosion control and timing responsibilities into the Operating Schedule; scheduling and enforcement of erosion control during and at completion of the timber sale, including non-recurring "C" provisions to protect soil and water resources in timber sale contracts; and seeking an environmental modification of the contract if new circumstances or



conditions indicate that soil, water, or watershed damage may occur. (BMPs 13.1, 13.2, 13.3, 13.4, 13.10, 13.11, 13.12, 13.14, 13.17, and 13.18)

**Soil/Water Protection During Road Development:** Implement measures to reduce surface erosion and drainage interruption related to transportation including water barring and cross-draining roads using ditches and culverts to prevent water running long distances over roads, closure, and seeding and fertilizing cut-and-fill slopes. (BMPs 14.1, 14.2, 14.3, 14.5, 14.7, 14.8, 14.9, 14.10, 14.11, 14.12, and 14.19)

**Soil/Water Protection During Road Management:** Conduct road maintenance and snow removal operations to minimize disruption of road surfaces, embankments, ditches, and drainage facilities, and use road closures or other measures to keep road surface and road site erosion at low or background levels. (TRAN23-I, BMPs 14.20 and 14.23)

**Management of Road Use to Reduce Erosion and Sedimentation:** Control access and manage road use to reduce the risk of erosion and sedimentation from road surface disturbance especially during the higher risk periods associated with high runoff and spring thaw conditions. (BMP 14.22)

**Temporary Road Closure:** Close temporary roads after use, remove drainage structures, and install waterbars in appropriate places. (RIP2-II and BMPs 12.17 and 14.24)

**Soil/Water Protection During Development of Rock Sources, LTFs, and Other Facilities:** Implement measures to reduce surface erosion and other impacts on soils and water from gravel sources and quarries, LTFs, sort yards, and other facilities. (BMPs 14.18, 14.19, 14.25, 14.26, and 14.27)

**LTF Siting:** Site LTFs in locations that will best avoid or minimize potential impacts on water quality, aquatic habitat, wildlife, and other resources. (TRAN214-V, WILD112, and BMP 14.4)

**Camp and Facility Siting:** Site camps and other facilities sufficiently far from important seasonal bear concentrations, raptor nest sites, and other important wildlife habitats to avoid or minimize wildlife-human conflicts. (WILD112)

**Sanitation at Facilities:** Comply with all regulations for the disposal of sewage at camps, LTFs, and other facilities; require incinerators and/or other bear-proof garbage disposal methods at work camps. (FAC1, FAC22, WILD112-VI, BMPs 12.10, 12.15, and 12.16)

**Accidental Spills:** Implement measures and plans to prevent the contamination of soil and water from accidental spills of petroleum products and hazardous substances. (BMPs 12.8 and 12.9)

**Heritage Site Discovery:** Suspend work if a heritage site is discovered during project implementation. Authorize resumption of work only after consultation with the SHPO is complete.

**Karst/Cave Inventory:** Inventory karst landscapes and cave resources prior to initiation of project planning. If caves or karst features are discovered during layout or implementation, a geologist prior to continuing with harvest activity will review these. (KARST-III)

**Maximum Size of Created Openings:** Limit created openings to a maximum size of 100 acres. (TIM114-IV)

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**Windthrow Hazards Along the Boundaries of Protected LUDs:** Where chance of windthrow in an adjacent stand (in a non-development LUD) is increased by timber harvest, measures will be taken to contain windthrow within a development LUD. (TIM114-XII)

**Certification of Reforestation:** Certify that every unit that receives a final harvest meets or surpasses the stocking guidelines and certification standards (FSH 2409.17) within 5 years. (TIM24)

**Wetland Protection:** Minimize the loss of all wetlands, but particularly the higher value wetlands (especially fens), and minimize the adverse impacts of land management activities on wetlands; follow Executive Order 11990 and the BMPs. (WET-I, WET-III, BMP 12.5)

**Beach and Estuary Fringe Protection:** Avoid harvest within the beach and estuary fringe; avoid road construction within this zone, except where no feasible alternative exists. (BEACH 2)

**Non-Development LUD Protection:** Avoid timber harvest impacts and minimize road construction within non-development LUDs such as Old-Growth Habitat, Remote and Semi-Remote Recreation, and Recreational River corridors.

**Connectivity Between Old Growth Reserves:** Provide corridors of old-growth forest between medium OGRs. Where sufficient connectivity does not exist, or where the minimum Forest Plan criteria are not met, relocate or redesign mapped, small OGRs. (WILD112-XVIII)

**Marine Mammal Protection:** Ensure that Forest Service permitted or approved activities are conducted in a manner consistent with the Marine Mammal Protection Act, the ESA, and NMFS regulations for approaching whales, dolphins, porpoises, seals, and sea lions. Site camps, LTFs, and other facilities at least 1 mile away from known Stellar sea lion haulouts. (TE&S-I)

## Monitoring

NFMA requires that the National Forests monitor and evaluate their forest plans (36 CFR 219.11). The importance of this requirement is emphasized in the National Monitoring and Evaluation Strategy (USDA Forest Service, 1993). This strategy is designed to focus agency attention and resources on evaluating how forest plans are being implemented in order to provide the Forest Service with the information needed to ensure responsive and efficient management of the National Forests. The strategy contains three principles: (1) evaluation of results will be readily available to the public, agencies, and other groups; (2) monitoring and evaluation will focus on ecosystems and will emphasize relationships among biotic and abiotic components of those ecosystems; and (3) the strategy will be flexible enough to meet local needs while encompassing forest, regional, and national requirements.

Three levels of monitoring are incorporated into Forest Plan monitoring:

**Implementation monitoring** is used to determine if the goals, objectives, standards and guidelines, and management prescriptions are implemented as detailed in the Forest Plan.



**Effectiveness monitoring** is used to determine if the standards and guidelines and the management prescriptions, as designed and implemented, are effective in meeting the Forest Plan goals and objectives.

**Validation monitoring** is used to determine whether the data, assumptions, and coefficients used in developing the plan are correct.

Most monitoring elements involve the mitigation measures discussed in the previous section. The three types of monitoring listed above are used to determine if the measures were implemented and if they are effective in mitigating the effects of the project or if they need to be revised. Information derived from monitoring can be used to develop improved or additional treatments to ensure that mitigation will be effective in the future.

A monitoring report is prepared by the Tongass National Forest and released each year. The report addresses all monitoring questions contained in the Forest Plan. It references all monitoring being conducted on the Tongass National Forest and assesses progress toward achieving the goals and objectives of the Forest Plan. The report either certifies that the Forest Plan is sufficient to guide management of the Tongass National Forest over the next year, or it proposes the changes needed to achieve the goals and objectives and an approach for making those changes.

Forest Plan monitoring is conducted over the entire Tongass National Forest on a sample basis. Samples will be taken within the Project Area. These results can be used to help answer questions regarding the implementation and effectiveness of mitigation within the Project Area. A number of implementation, effectiveness, and validation monitoring items are identified for each resource area in the Forest-wide monitoring plan described in the Forest Plan (USDA Forest Service, 1997a).

In addition, implementation monitoring is conducted in each project area to assess whether the project was implemented as designed and whether it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of the harvest units and the road system. Specialists used on-the-ground inventories, computer inventories, and aerial photographs to prepare a unit card for each harvest unit in each alternative (Appendix B). Cards were also prepared for each road (Appendix C). Resource specialists recorded their concerns on the cards and the mitigation measures needed to address those concerns in the design of each unit and road. Silvicultural prescriptions were prepared for each unit in each alternative. These concerns, mitigation measures, and prescriptions will be refined during the final layout phase of the project, when specialists will use the knowledge they gain in the field to revise and improve the unit card and road card recommendations and prescriptions as needed. Implementation monitoring will use the final unit card and road card mitigation measures and prescriptions as the basis for determining whether recommendations were implemented in the project.

Routine post-sale monitoring is also done by the road maintenance crew and by silviculturists. The road maintenance crew annually checks roads on the district for trees across the road, plugged culverts, and brushing needs. The silviculturist routinely monitors each harvest unit to determine if adequate regeneration of trees to meet NFMA requirements has been accomplished.

Mitigation measures and prescriptions are translated into contract specifications for timber harvest and road construction. Forest Service timber sale administrators and engineering representatives regularly inspect operations to ensure that harvest activities



## 2 Alternatives

and road construction adhere to contract specifications. Implementation monitoring forms are completed during these inspections according to Tongass National Forest BMP Implementation Monitoring Protocols. Resource specialists such as hydrologists and wildlife biologists are available to assist with inspections as necessary. An IDT conducts quality control implementation monitoring to 10 percent of all harvested units and road projects annually across the Tongass National Forest.

Specific monitoring efforts that are proposed for the Madan project, either as part of Forest Plan monitoring or as part of routine implementation monitoring, are described in Appendix G (this appendix identifies the objective, method, actions, and cost for each proposed monitoring effort).

### Comparison of Alternatives

This section compares the alternatives based on how they respond to the major issues discussed in Chapter 1. The information presented here is derived from the analyses presented in Chapter 3. The affected environment and the environmental effects are discussed in greater detail in Chapter 3. A comparison of Alternatives 1 through 5 is provided in Table 2-1 at the end of this chapter. Figures 2-1 through 2-4 are also provided at the end of this chapter.

#### Issue 1: Scenic Quality and Recreation Values

There is concern about how this sale would affect scenic quality and recreation values, particularly in and around Virginia Lake and along the Eastern Passage (Back Channel). All alternatives are designed to be consistent with the Forest Plan by meeting the VQOs of Retention and Partial Retention that are prescribed for the areas seen from visual priority travel routes and use areas. Alternative 1 would result in no changes along visual priority travel routes and use areas, or anywhere in the Project Area. Alternatives 3 and 4 would result in the least noticeable harvest activities among the action alternatives (Table 2-1). Both alternatives would completely avoid the Virginia Lake watershed and Alternative 4 would not permit any clearcutting and only very minimal road building, except in “not seen” areas within the Moose Creek watershed. Alternative 2 is the least responsive alternative for maintaining current scenic quality (Table 2-1). Because of the extent of proposed harvest in the Virginia Lake and Jenkins Cove watersheds, some viewers would notice the alteration; however, the level of alteration would be subordinate to the characteristic landscape. Alternative 5 would have almost the same degree of alteration along visual priority travel routes and use areas as Alternative 2, but would not include any harvest in the Moose Creek drainage. Two LTFs would be visible from the Eastern Passage under Alternatives 2, 3, or 4, one would be visible under Alternative 5, and none would be visible under Alternative 1.

Alternative 1 would not result in any change in the recreation settings of the Project Area. Alternative 4 would have the smallest effect among the action alternatives, resulting in a decrease of approximately 1,380 acres of non-motorized ROS settings (Table 2-1). Alternatives 3 and 5 would result in an intermediate decrease of non-motorized ROS settings and Alternative 2 would decrease unroaded settings by approximately 4,356 acres.

Under the action alternatives, Option A (roads mostly open after sale) would allow limited use by high-clearance highway vehicles as well as full use by non-highway/all-



terrain vehicles (ATVs), mountain bikers, and hikers. Option B (roads mostly closed after sale) would not allow use by motorized vehicles but would allow full use by mountain bikers and hikers. See Appendix F (Appendix Table F-1) for details on specific road segments for each option.

## Issue 2: Timber Management and Economics

This issue deals with concern regarding the amount of timber to be harvested, the long-term timber supply, the effect on local communities, and the economic viability of the sale. Of the 17 million acres that make up the Tongass National Forest, approximately 10 million acres are identified as forest land. The Forest Plan allocates 664,000 of these acres, or approximately 7 percent of the forest land, as suitable for timber management. The Project Area includes about 10,000 acres of suitable timber lands, or about 1.5 percent of the suitable land and 2 percent of the productive forest land on the Tongass. Because of OGR expansion under the action alternatives, the suitable timber lands in the Project Area would be reduced by about 1,084 acres. The Madan Timber Sale proposes up to 2,105 acres for timber management or up to 0.3 percent of the suitable lands and less than 0.1 percent of the productive forest land on the Tongass (Table 2-1). The project would have a positive effect on the local timber industry in Wrangell, with the greatest positive benefits being produced under Alternative 2 and the smallest being derived from Alternatives 3 and 4. Alternative 1 would potentially have negative effects on the local economy by contributing to the continuation of negative trends in the timber industry.

The economic viability of the timber sale is of concern to industry and the public. In Chapter 3, alternatives are compared under a high market and a low market scenario. All action alternatives produce positive net stumpage values under the high market and negative net stumpage values under the low market scenarios (Table 2-1). Chapter 3 also presents estimates of the expected bid value for each alternative under current (June 2002) market conditions. These estimates were developed with the NEPA Economic Analysis Tool (NEAT), a spreadsheet model developed by the Forest Service for this purpose. All action alternatives produce negative expected bid values under current market conditions.

Actual stumpage returns are very difficult to predict and the estimated values should be considered relative values for alternative comparisons, rather than definitive predictions of actual returns. Results indicate that in terms of economic efficiency, Alternatives 2 and 5 would be best, followed by Alternatives 3 and 4, respectively. The primary reason for the lower economic efficiency under Alternative 3 or 4 is the high proportion of volume that is planned for helicopter yarding under these alternatives.

## Issue 3: Wildlife Habitat

The Forest Plan has identified a conservation strategy to ensure wildlife viability on the Tongass National Forest, that is based heavily on a series of large, medium, and small OGRs, and connectivity among them. The Project Area includes two small OGRs that are part of this system. Both OGRs are smaller in size and the Virginia Lake OGR also contains less productive old growth than is recommended by the Forest Plan. Under Alternative 1, the OGRs would not be modified and would remain the same in size; however, there would be no timber management in adjacent areas and such areas could be used for future old-growth unit expansion if needed. Under Alternatives 2, 3, 4, and 5,



## 2 Alternatives

both OGRs would be expanded based on recommendations of the team of biologists who studied them, and would meet or exceed the minimum Forest Plan recommendations for both total size and amount of productive old growth.

The other major part of the Forest Plan conservation strategy relates to the management of the lands where timber harvest may occur according to a set of standards and guidelines. The Madan action alternatives involve extensive use of a variety of silvicultural techniques designed to enhance wildlife diversity over time. A portion of the lands are proposed for clearcutting, but at least 10 percent reserve trees would be left behind as legacies. Most of the lands involved in each alternative have a prescription of individual tree or group selection that would provide much greater structural diversity over time. Alternative 2 would affect the greatest number of acres and Alternative 5 would have the fewest number of acres treated (Table 2-1); however, Alternatives 2 and 5 would result in the greatest number of clearcut acres and Alternatives 3 and 4 the least number of clearcut acres.

Other factors that relate to this issue are the change in deer habitat capability over time, future road densities, and the areas of high value habitats to be harvested. Deer habitat capability declines would range from 0 percent under Alternative 1 to a maximum of 6.4 percent over time under Alternative 2 (Table 2-1). The smallest decline among the action alternatives would be the 3.8 percent reduction associated with Alternative 4. Future road densities in the Wildlife Analysis Areas (WAAs) under all action alternatives would remain far below the 0.7-mile per square mile of open roads recommended for the protection of wolves. High value habitats for marten, northern goshawks, and marbled murrelets would not be affected with Alternative 1 and would be maximally harvested under Alternative 2 (Table 2-1). Lowest effects on high value habitats for marten and murrelets would occur under Alternative 5 and for goshawks under Alternative 4.

### Issue 4: Road Access Management

This issue deals with future accessibility within the Project Area. It is related to how many roads are constructed and how those roads are managed after construction. No roads would be constructed under Alternative 1 and almost 19 miles of permanent forest roads would be developed under Alternative 2 (Table 2-1). Alternative 5 would result in the development of approximately 13 miles of permanent roads and Alternatives 3 and 4 would result in approximately 8 and 6 miles of permanent road development, respectively. Temporary road development would be limited to between 0.6 and 2.6 miles under the action alternatives (Table 2-1). Following harvest, all temporary roads would be decommissioned and permanent roads would be left open or closed, depending on the road management option selected. Another aspect of this issue is balancing the benefits to public recreation and use of the area after timber sale harvest with the costs of long-term road maintenance and impacts to wildlife, watersheds, and fish, in an area relatively close to the community of Wrangell. Comparisons in this regard are found in Chapter 3 under Issue 4: Road Access Management.

To analyze effects of a range of road management alternatives, two road management options are being considered in all action alternatives. Option A would manage the majority of the classified road system as open. Option B would manage the specified road system as closed after timber harvest was complete. Permutations with the range of these options are possible with some roads managed as open and others closed. Appendix F (Appendix Table F-1) describes the maintenance and traffic management strategies proposed for each road segment under each option.



## **Issue 5: Madan Inventoried Roadless Area**

The Project Area is part of an extensive mainland area that is currently unroaded. Building roads in previously unroaded areas is of national concern, as well as being a local issue, and is the subject of the recently issued Roadless Area Conservation Rule (although the Madan Project was exempted from the final rule). A Tongass-wide roadless area evaluation for wilderness recommendations was recently published as a Supplemental EIS (USDA Forest Service, 2003) to the Forest Plan. Some people would like to see no roads constructed in the Project Area, while others would like to see roads built for recreation and subsistence activities, as well as for timber harvest. Under Alternative 1, no change would occur in the size of the Madan Inventoried Roadless Area (69,738 acres). The action alternatives would result in timber harvest and road construction within the roadless area and this would reduce the size of the Madan Inventoried Roadless Area by an amount ranging from 1,930 acres under Alternative 4 (3-percent) to 5,852 acres under Alternative 2 (8 percent). The areas that contain the highest values for resources other than timber management would not be roaded.



## 2 Alternatives

Table 2-1.  
Comparison of Alternatives

Issue	Units	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
<b>Scenic Quality and Recreation Values</b>						
Area of clearcuts seen from KVA 1—Virginia Lake	acres	0	24	0	0	24
Area of uneven-aged management seen from KVA-1—Virginia Lake	acres	0	196	0	0	196
Area of clearcuts seen from KVA-2—Eastern Passage	acres	0	97	70	0	97
Area of uneven-aged management seen from KVA-2—Eastern Passage	acres	0	295	412	461	260
Loss of Non-motorized ROS settings <sup>1/</sup>	acres	0	4,356	2,248	1,380	2,239
<b>Timber Management and Economics</b>						
Total volume of timber harvested	MMBF	0	32,169	19,053	19,491	20,646
Total area treated	acres	0	2,105	1,719	1,769	1,353
Area clearcut (with 10% retention) by cable	acres	0	719	356	283	436
Area clearcut (with 10% retention) by helicopter	acres	0	72	25	0	72
Area of patch and selection harvest by cable	acres	0	129	0	0	129
Area of patch and selection harvest by helicopter	acres	0	1,185	1,338	1,486	716
Percent of suitable land harvested	%	0	24	20	20	15
Net stumpage high-value market <sup>2/</sup>	\$/MBF	0	135.53	102.69	100.76	154.89
Net stumpage low-value market <sup>3/</sup>	\$/MBF	0	(255.96)	(286.83)	(286.91)	(246.94)
Expected Bid under Current Conditions (June 2002 NEAT) <sup>4/</sup>	\$/CCF	0	(31.87)	(46.57)	(54.79)	(37.35)
Classified road construction <sup>5/</sup>	miles	0	18.6	8.4	5.9	12.9
Temporary road construction <sup>5/</sup>	miles	0	2.7	0.6	0.8	1.8
<b>Wildlife Habitat</b>						
Area of productive old growth with reduced volume due to selective harvest	acres	0	1,048	1,071	1,218	843
Area of productive old growth changed to early seral vegetation due to clearcut harvest	acres	0	891	485	388	503
Area of productive old growth in Virginia Lake OGR	acres	946	3,959	3,959	3,959	3,959
Area of productive old growth in Madan OGR	acres	1,454	2,118	2,118	2,118	2,118
Future road density in WAA 1810 <sup>5/</sup>	mi/mi <sup>2</sup>	0	0.07	0.01	0.00	0.07
Future road density in WAA 1811 <sup>5/</sup>	mi/mi <sup>2</sup>	0	0.10	0.06	0.05	0.06
Future project area open road density under Road Management Option A <sup>5/</sup>	mi/mi <sup>2</sup>	0	0.6	0.2	0.2	0.4
Future project area open road density under Road Management Option B <sup>5/</sup>	mi/mi <sup>2</sup>	0	0	0	0	0
Long-term change in deer habitat capability	%	0	(6.4)	(5.3)	(3.8)	(5.1)
Reduction in the amount of high-value (HSI >0.6) deer winter range (1,395 ac in Project Area)	acres	0	132	252	232	132
Reduction in amount of high-value marten habitat (7,509 ac in Project Area)	acres	0	980	735	718	662
Reduction in amount of high-value goshawk habitat (5,402 ac in Project Area)	acres	0	542	474	409	424
Reduction in amount of high-value murrelet habitat (15,992 ac in Project Area)	acres	0	1,131	793	798	673

Table 2-1.  
Comparison of Alternatives (continued)

Issue	Units	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
<b>Road Access Management</b>						
Roads open to motorized travel use in Option A <sup>5/6/</sup>	miles	0	15.0	7.4	4.6	10.3
Roads open to motorized travel use in Option B <sup>5/6/</sup>	miles	0	0	0	0	0
Percent of Project Area within one mile of road		0	31.2	21.2	13.9	19.2
<b>Madan Inventoried Roadless Area</b>						
Size of Roadless Area after Implementation	acres	69,738	63,886	65,980	67,808	65,808
<b>Other Issues</b>						
Area of harvest-related ground disturbance	acres	0	66	41	37	36
Area of road-related ground disturbance <sup>5/</sup>	acres	0	145	61	46	100
Area of harvest on MMI 3 soils	acres	0	478	524	547	185
Road length on MMI 3 and MMI 4 soils <sup>5/</sup>	miles	0	4	3	0	0
Jenkins Cove LTF constructed	Y/N	N	Y	Y	Y	Y
Moose Creek LTF constructed	Y/N	N	Y	Y	Y	N
Timber volume processed through Jenkins Cove LTF	MBF	0	21,937	12,425	8,235	20,646
Timber volume processed through Moose Creek LTF	MBF	0	10,231	6,628	10,231	0
Timber volume processed through barge	MBF	0	0	0	748	0
Percent of evaluation watershed area harvested <sup>7/</sup>	%	0	2.8	1.6	1.7	1.7
Percent of watershed area roaded <sup>5/</sup>	%	0	0.3	0.1	0.1	0.2
Number of Class I stream crossings	#	0	0	0	0	0
Number of Class II stream crossings	#	0	6	3	0	6
Road length on wetlands <sup>5/</sup>	miles	0	6.5	2.2	0.1	6.0
Roads constructed on wetlands <sup>5/8/</sup> (7,925 acres of wetlands in Project Area)	acres	0	39	13	1	36
Percent area of Virginia Lake area harvested <sup>9/</sup>	%	0	0.6	0	0	0.6

<sup>1/</sup> Includes the net reduction in Primitive and Semi-primitive Non-motorized ROS settings, combined.

<sup>2/</sup> These values are based on prices for June 1995 (second quarter), adjusted to 1998 dollars.

<sup>3/</sup> These values are based on prices for December 1998 (fourth quarter), expressed in 1998 dollars.

<sup>4/</sup> These values represent the results of a preliminary financial appraisal conducted using the NEPA Economic Analysis Tool (NEAT). These values are based on prices for June 2002 (second quarter) and expressed in 2002 dollars.

<sup>5/</sup> The road lengths in this table (and throughout most of this EIS) are GIS lengths, which are typically slightly less than lengths measured on the ground.

<sup>6/</sup> Includes the use of non-highway vehicles.

<sup>7/</sup> Evaluation watersheds include Porterfield Creek, Glacier Creek, Virginia Lake, Gypsy Creek, Jenkins Creek, Madan Bay, and Moose Creek.

<sup>8/</sup> Assumes a 50-foot-wide road width, although the majority of the roads would be 25 feet wide.

<sup>9/</sup> Includes the Glacier Creek (A07C), Porterfield Creek watershed (A07B), and the small watersheds draining into Virginia Lake (A07D).

Values in parentheses ( ) are negative.

#### Acronyms:

KVA=Key Viewing Area	ROS=Recreational Opportunity Spectrum	
MMBF=Million Board Feet	MBF=Thousand Board Feet	
CCF=hundred cubic feet	HSI=Habitat Suitability Index	MMI=Mass Movement Index
WAA=Wildlife Analysis Area	LTF=log transfer facility	OGR=Old-Growth Reserve



## 2 Alternatives

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Figure 2-1

Map of Alternative 1



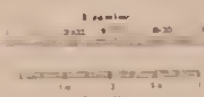


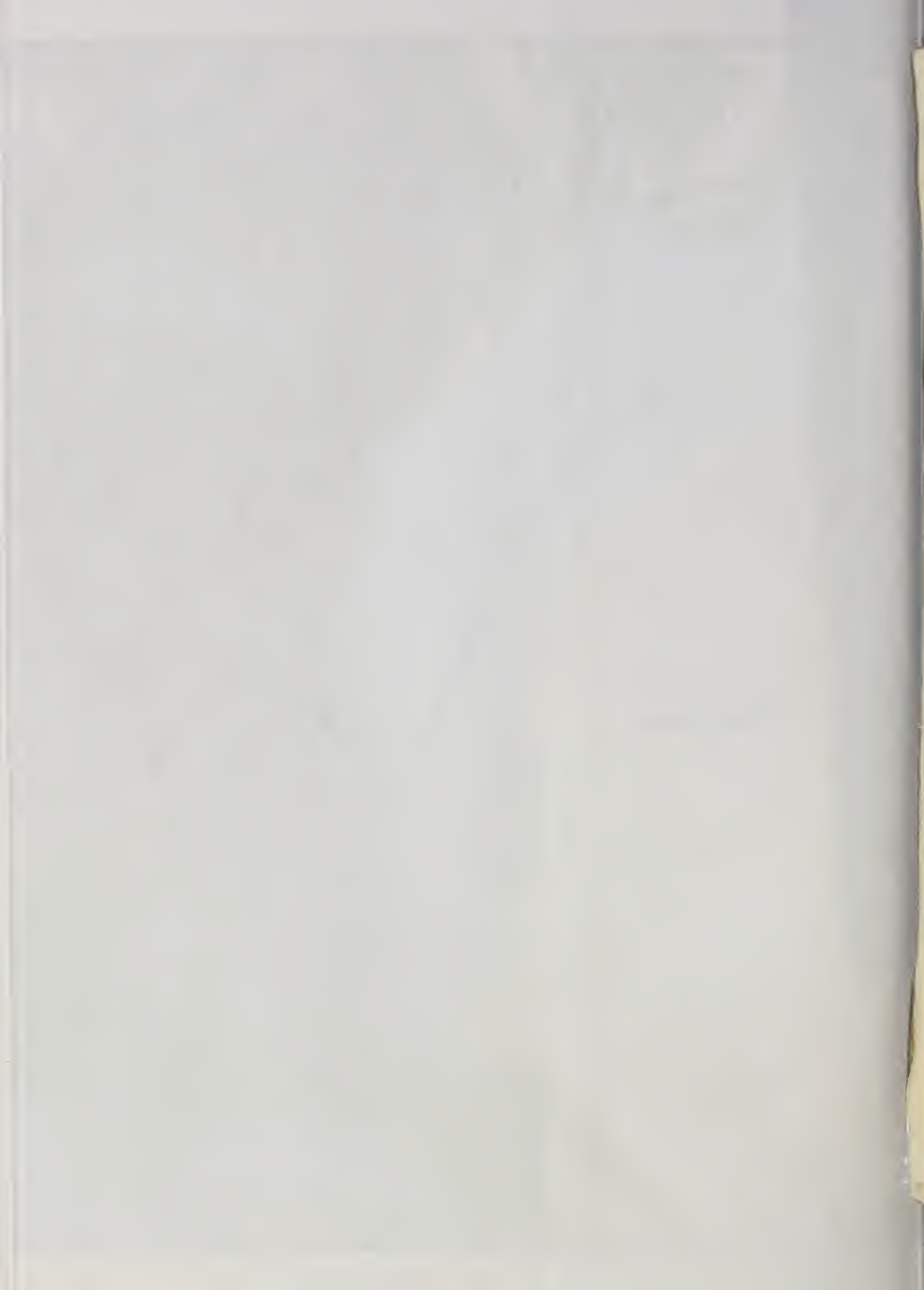


Figure 2-2  
Map of Alternative 2



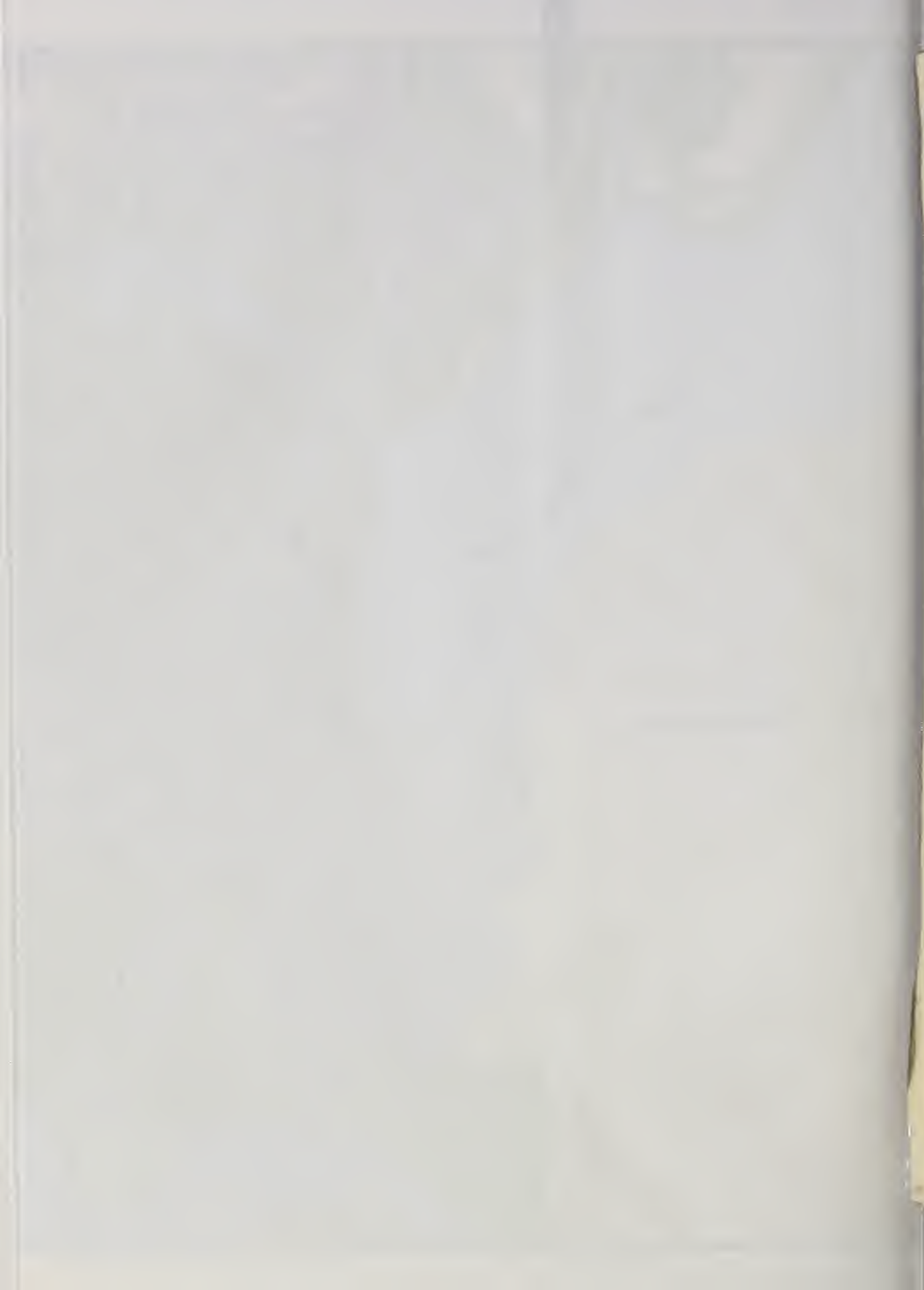
- M-10 Unit Number
- Unit Boundary
- State Land Boundary
- Specified Road
- Specified Road (to be placed in storage after timber sale)
- Temporary Road
- Streams
- Class 1
- Class 2
- Class 3
- Class 4
- E Log Transfer Facility (LTF)
- S Sort Yard
- General Barge Location
- Prescriptions:
- Clear Cut (Minimum 10% Retention)
- Patch Cut (Minimum 60% Retention)
- Group Selection (Minimum 70% Retention)
- Individual Group Selection (Minimum 70% Retention)
- Individual Group Selection (Minimum 50% Retention)
- Productive Forest
- Non-Productive Forest
- Non-Forest
- OGP











Map of Alternative 4

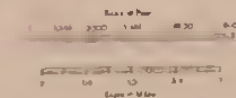
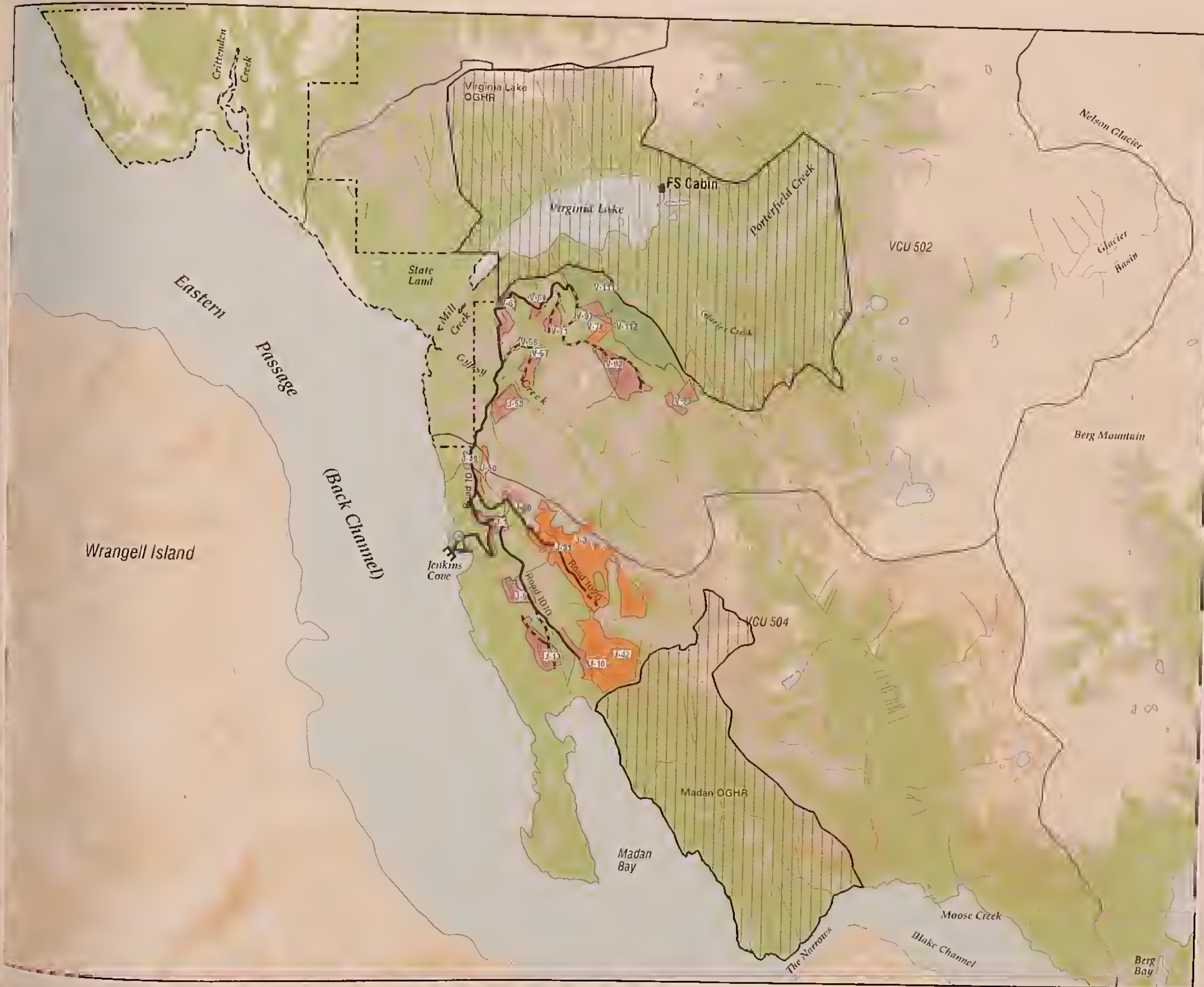


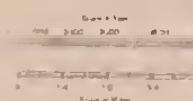




Figure 2-5  
Map of Alternative 5



- Legend**
- Unit Number**
  - Unit Boundary**
  - State Land Boundary**
  - Specified Road**
  - Specified Road (to be placed in storage after timber sale)**
  - Temporary Road**
  - Streams**
    - Class 1
    - Class 2
    - Class 3
    - Class 4
  - E Log Transfer Facility (LTF)**
  - S Sort Yard**
  - B General Barge Location**
  - Prescriptions:**
    - Clear Cut (Minimum 10% Retention)
    - Patch Cut (Minimum 60% Retention)
    - Group Selection (Minimum 70% Retention)
    - Individual / Group Selection (Minimum 70% Retention)
    - Individual / Group Selection (Minimum 50% Retention)
  - Productive Forest**
  - Non-Productive Forest**
  - Non-Forest**
  - OGH**





# CHAPTER 3

## AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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## THE PRODUCTION OF A POLYMERIZATION REACTION



# CHAPTER 3

## AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

### Introduction



In this chapter, the environment that would potentially be modified by the project and the environmental effects associated with the significant issues are described. These include scenic quality and recreation values, timber management and economics, wildlife habitat, road access management, and the Madan Inventoried Roadless Area. Other concerns raised during public scoping that are not significant issues are also discussed. Other environmental considerations and required disclosures are addressed at the end of the chapter.

It should be noted that the numbers presented in this chapter (and in the other chapters that depend on this one) are generally rounded to the nearest acre, mile, penny, or percent, or in some cases, to the nearest tenth of an acre, mile, or percent. Therefore, the sums of individual rounded numbers will often be slightly higher or lower than the expected sums. The sums that are presented are generally the sums of the unrounded numbers.

### Land Divisions

The land area of the Tongass National Forest has been divided in several different ways to describe the different resources and allow analysis of how they may be affected by Forest Plan and project-level decisions. These divisions vary by resource since the relationship of each resource to geographic conditions and zones also varies. The allocation of Forest Plan land use designations (LUDs) (discussed in Chapter 1) is one such division. Other divisions important for the effects analysis are described briefly here.

#### ***Value Comparison Units (VCUs)***

These are distinct geographic areas, each encompassing a drainage basin containing one or more large stream systems. The boundaries usually follow major watershed divides. Portions of VCUs 502 and 504 are included in the Project Area. Chapter 1 includes a map showing their location (Figure 1-3).

#### ***Wildlife Analysis Areas (WAAs)***

These are land divisions used by the Alaska Department of Fish and Game to report community harvests of selected wildlife species. The project area includes parts of WAA 1810 and 1811. Information estimated by WAA is used in the wildlife and subsistence analyses.

### **3 Affected Environment and Environmental Consequences**

#### ***Project Area***

The project area is identified by the Interdisciplinary Team (IDT) to define the boundary of the area in which the project will occur. The project area for the Madan Timber Sale project is approximately 44,000 acres in size and includes Virginia Lake and Mill Creek (in the north), Madan Bay (in the southwest), and Moose Creek (in the southeast).

#### ***Watershed***

Watershed refers to the area that contributes water to a drainage or stream, to that portion of a landscape in which all surface water drains to a common point. Watersheds can range from tens of acres that drain a single small intermittent stream to many thousands of acres for a stream that drains hundreds of connected intermittent and perennial streams.

#### ***Inventoried Roadless Area (IRA)***

Inventoried Roadless Areas are undeveloped areas typically exceeding 5,000 acres that met the minimum criteria for wilderness consideration under the Wilderness Act and that were inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or forest planning. The Madan Timber Sale project falls within IRA #204.

#### ***Ecological Subsections***

This refers to a mapping delineation devised as part of a national hierarchical framework designed to group ecosystems into logical associations. The Madan project area is mapped as "Eastern Passage Complex" in this system.

#### ***Biogeographic Province***

This designation refers to twenty-one ecological subdivisions of Southeast Alaska that are identified by generally distinct ecological, physiogeographic, and biogeographic features. Plant and animal species composition, climate, and geology within each province are generally more similar within than among adjacent provinces. Historical events (such as glaciers and uplifting) are important to the nature of the province and to the barriers that distinguish each province. The Madan Timber Sale project area is part of the Central Coast Range Biogeographic Province. Effects of management at this scale are analyzed as part of the Forest Plan.

### **Analyzing Effects**

Environmental consequences are the effects of implementing an alternative on the physical, biological, social, and economic environment. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) include the following specific categories to use for the analysis of environmental consequences.

#### ***Direct, Indirect and Cumulative Effects***

Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity. Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. We tend to view reasonably foreseeable actions as those that are currently planned or scheduled to occur. Our 10-year timber sale



plan is the instrument through which future timber sales are scheduled. Therefore, for the purpose of this analysis, reasonably foreseeable future actions are considered to be those that will occur within the next 10 years.

In the environmental consequences sections, the direct and indirect effects are presented first, followed by cumulative effects. For the purpose of evaluating cumulative effects, we considered all lands in the Project Area, together with other lands outside the Project Area, but in the Madan Roadless Area (Roadless Area #204), and adjacent state lands (over 70,000 acres). For some resources, an expanded boundary was evaluated.

### ***Past and Present Actions***

In 1959 there was a 34-acre clearcut that was logged at the mouth of Moose Creek.

### ***Reasonably Foreseeable Future Actions***

The Crittenden Timber Sale is located north of the Madan Project Area, within Roadless Area #204. The Crittenden project is on the Tongass 10-year Timber Sale Schedule, with an estimated 40 MMBF of timber associated with the project. The Crittenden study area is approximately 34,000 acres, of which about 9,000 acres are suitable and available.

The Department of Natural Resources (DNR) had shown interest in commercial timber harvest within state land located to the northwest of the Madan Project Area and to the west of the Crittenden Project Area. However, their current 5-year sale plan does not list any projects proposed for the area.

### ***Unavoidable Adverse Effects***

Implementation of any alternative, including the No-action Alternative, would cause some adverse environmental effects that cannot be effectively mitigated or avoided.

Unavoidable adverse effects often result from managing the land for one resource at the expense of the use or condition of other resources. Many adverse effects can be reduced, mitigated, or avoided by limiting the extent or duration of activities. The interdisciplinary procedure used to identify specific harvest units and roads was designed to eliminate or lessen significant adverse consequences. The application of Forest Plan Standards and Guidelines, Best Management Practices, project-specific mitigation measures, and monitoring are all intended to further limit the extent, severity, and duration of potential effects. Such measures are discussed throughout this chapter. Regardless of the use of these measures or the alternative selected, some adverse effects will occur. The purpose of this chapter is to fully disclose these effects.

### ***Short-term Use and Long-term Productivity***

Short-term uses, and their effects, are those that occur annually or within the first few years of project implementation. Long-term productivity refers to the capability of the land and resources to continue producing goods and services long after the project has been implemented. Under the Multiple-Use Sustained-Yield Act, and the National Forest Management Act, all renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be reestablished and grown again if the long-term productivity of the land is maintained. This long-term productivity is maintained through the application of the resource protection measures described in Chapter 2 and discussed throughout this chapter.

### **3 Affected Environment and Environmental Consequences**

#### ***Irreversible and Irretrievable Commitments***

Irreversible commitments are decisions affecting non-renewable resources where renewal can occur only over a long period of time or at a great expense, or because the resource has been destroyed or removed. Irretrievable commitments represent opportunities forgone for the period during which resource use or production cannot be realized. These are addressed at the end of this chapter.

#### ***Energy Requirements and Conservation Potential***

An analysis of the Energy Requirements and Conservation Potential is presented at the end of this chapter.

## Issue 1: Scenic Quality and Recreation Values

There is concern that timber harvest associated with the Madan sale will be visible from the Eastern Passage, Virginia Lake, and parts of Wrangell Island. As a result, there is concern that the scenic quality of the Project Area will be diminished along with recreational experiences. Although there is not a great deal of recreational activity that occurs in the Project Area outside of the Virginia Lake and Mill Creek areas, the high scenic quality of the Project Area is an important part of the recreational experience for many. Residents, recreationists, and outfitter/guides that use and/or pass near the Project Area can view it for extended periods of time.

We have divided this issue into two main components:

- The effects of the alternatives on scenery
- The effects of the alternatives on potential roaded and unroaded recreation areas and on recreation experience (including impacts on outfitters and guides).

### Scenery

The Project Area is located on the portion of the mainland east of Wrangell Island. It has been classified as having a landscape type with a Coastal Hill scenic character type. This character type has extensive landform variety with rounded, but steep, hills rising up from saltwater (Figure 3-1). Behind and above the coastal hills are rugged glaciated mountain peaks that rise to elevations over 4,500 feet. These hills and mountains are dissected by steep-walled, u-shaped valleys and fjords. Drainages are characterized by short, swift streams and many lakes and waterfalls. The coastal hillsides are covered with hemlock-Sitka spruce forest type that gives the visual impression of uniform color and texture. Scattered muskegs, rock outcrops, and glaciated peaks break up the uniform appearance of the forest.

The northernmost portion of the Project Area surrounds Virginia Lake and the southernmost is located in and encompasses the Moose Creek drainage. The Project Area is largely untouched by human activities and maintains a pristine appearance. Across the Eastern Passage from the Project Area on Wrangell Island are state and federal lands that have been extensively harvested and are quite visible from the Eastern Passage (Figure 3-2). State lands on the mainland adjacent to the Project Area have not yet been harvested.

The Project Area is most commonly viewed by people in boats from the Eastern Passage, several areas on Wrangell Island, Virginia Lake, and flying into Virginia Lake. The area can also be viewed from boats passing through The Narrows and from the northern portion of Blake Channel (Figure 3-3).

Individuals boating along the Back Channel can view the Project Area for extended periods of time. Viewers on Wrangell Island include residents of several homes along the shores of the Back Channel, people driving along Forest Road 6265, and recreationists at Earl West Cove. Recreationists using Virginia Lake and/or staying at the Virginia Lake Forest Service cabin also have views of parts of the Project Area.



### **3** Affected Environment and Environmental Consequences

Figure 3-1.  
Photograph of Project Area Landscape Type (Virginia Lake and Mill Creek  
Inlet)

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Figure 3-2.  
Photograph of Wrangell Island from Earl West Cove

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The Forest Plan identified important travel routes and use areas that dictate which Visual Quality Objectives (VQOs) must be met, depending on the LUD in which an activity is proposed. These routes and use areas are listed in Appendix F of the Forest Plan. Routes and use areas which may be affected by this project include: Eastern Passage and Blake Channel (Travel Routes); Road 6265 on Wrangell Island (Public Use Roads); Virginia Creek and Lake (Recommended Recreation River); Earl West Cove (Saltwater Use Areas); Virginia Lake (Dispersed Recreation Areas); Virginia Lake Cabin (Forest Service Cabins); Earl West Picnic Area (Developed Recreation Sites); and Mill Creek Trail #515 (Hiking Trails).

## ***Desired Future Scenic Condition***

Desired future conditions for visual quality are guided by management prescriptions and corresponding VQOs in the Forest Plan. Management prescriptions include the identification of LUDs for all lands in the Tongass National Forest. The LUDs that have been assigned to the Project Area are depicted in Figure 3-4, and include: Old-Growth Habitat, Recreation River, Scenic Viewshed, Modified Landscape, and Timber Production. All of the LUDs in the Project Area except Old-Growth Habitat allow some level of timber harvest.

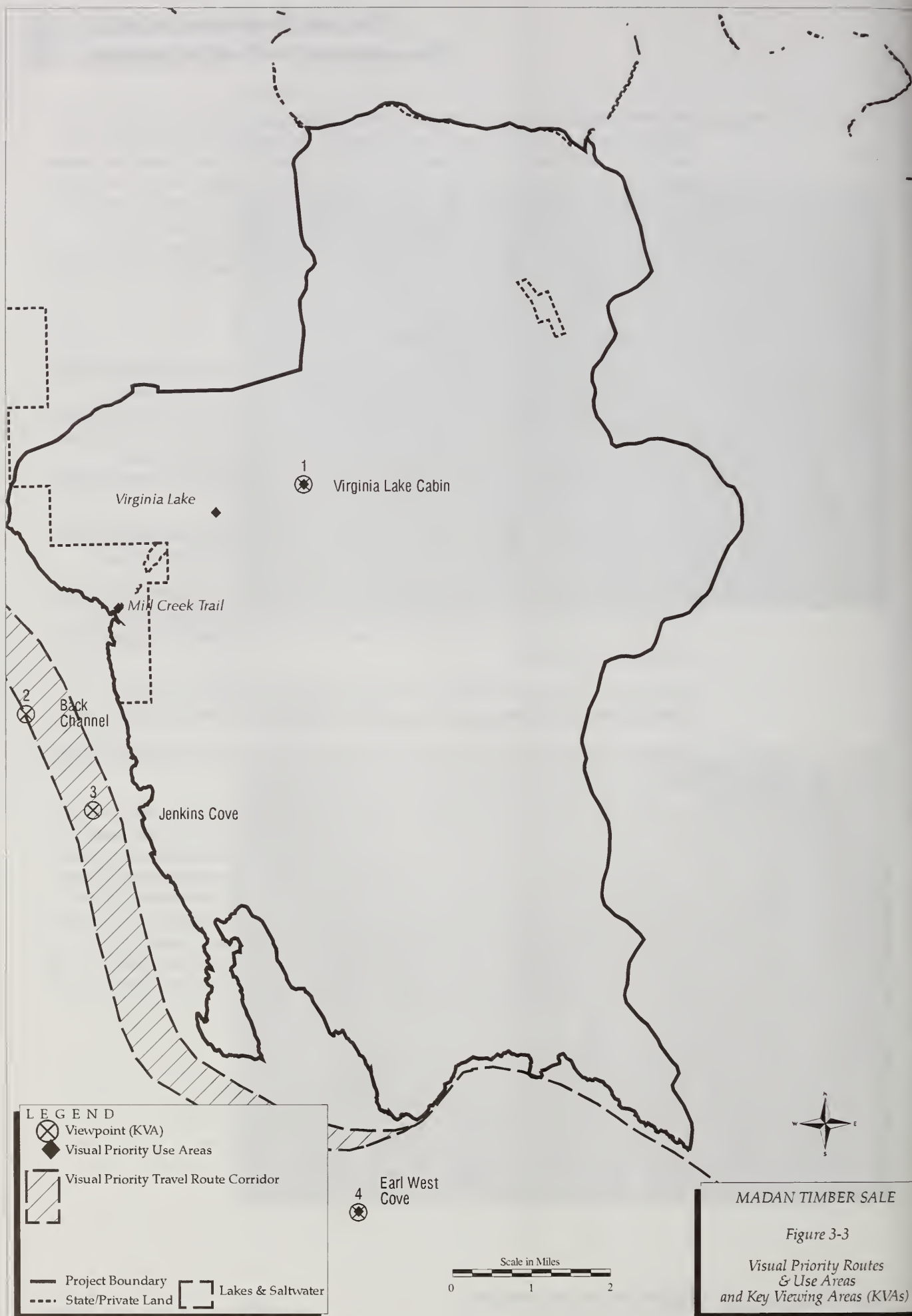
There are two OGRs in the Project Area. They are the Virginia Lake and Madan OGRs. A Recreation River LUD follows Virginia Lake and the Porterfield Creek drainage.

The Scenic Viewshed LUD begins at the coastline and continues up into the high country of the Project Area. This area was assigned the Scenic Viewshed LUD primarily to protect the scenic quality of views from Eastern Passage/Blake Channel, Virginia Lake, and the Earl West Cove.

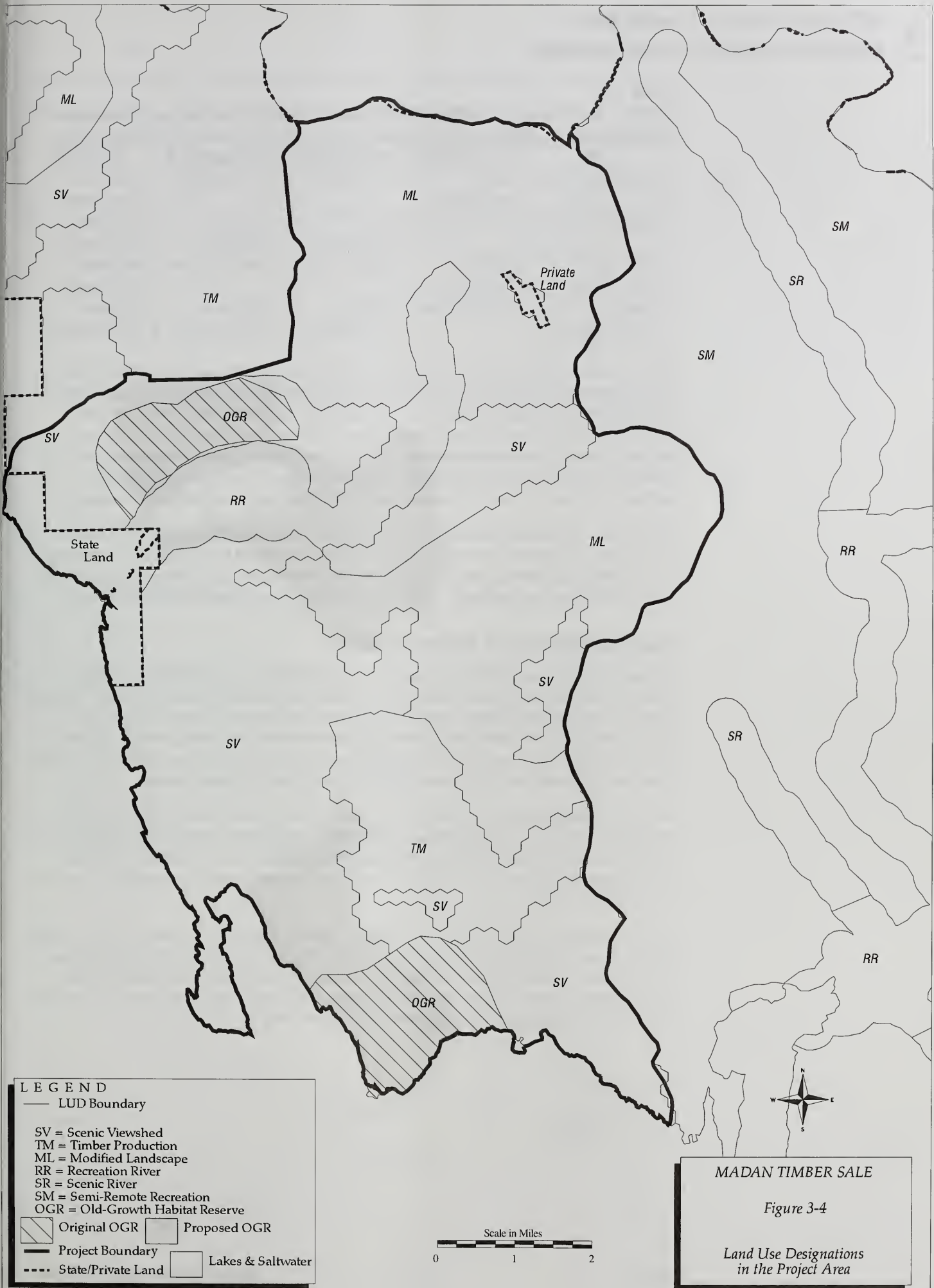
The Modified Landscape LUD area is located primarily in areas that are in the middleground and background when viewed from Visual Priority Routes and Use Areas.

The Timber Production LUD is located in high areas away from the shoreline that are also unseen from Visual Priority Routes and Use Areas.

The primary component of the Visual Management System used by the Forest Service is the Visual Quality Objective (VQO). Activities that would change the appearance of National Forest System lands must meet established VQOs. VQOs for a particular area are determined in the Forest Plan, depending on the LUD and the distance from Visual Priority Routes and Use Areas. VQOs are expressed in terms of the objective for the landscape and range from minimally disturbed to highly disturbed landscapes. The VQOs that are found in the Project Area are, in order from least disturbed to most disturbed: Retention, Partial Retention, Modification, and Maximum Modification (Figure 3-5). The VQOs shown in Figure 3-5 are based on distances and views from Visual Priority Travel Routes and Use Areas (Table 3-1).







### 3 Affected Environment and Environmental Consequences

Table 3-1.

**LUDs in the Project Area that could Support Timber Harvest and Assigned VQOs based on Distance Zone from Visual Priority Routes and Use Areas**

LUD	Foreground	Middleground	Background	Not Seen
Recreation River	Partial Retention	Modification	Modification	Maximum Modification
Scenic Viewshed	Retention	Partial Retention	Partial Retention	Maximum Modification
Modified Landscape	Partial Retention	Modification	Modification	Maximum Modification
Timber Production	Modification	Maximum Modification	Maximum Modification	Maximum Modification

The Retention VQO requires that harvest activities must not be visually evident to the casual observer. With the Partial Retention VQO, harvest activities must be subordinate to the landscape character of the area. In areas with the Modification VQO, harvest activities may visually dominate the landscape, but must have visual characteristics similar to those of natural occurrences within the surrounding area or character type. In areas with the Maximum Modification VQO, harvest activities may dominate the landscape, yet when viewed as background, should appear to be a natural occurrence.

The Visual Absorption Capability (VAC) of an area also influences the level of harvest activity that is compatible with the VQO. VAC is determined by the general complexity of the landscape, the slope, and the distance from which a person would view an area; it is expressed as high, intermediate, or low. All three VACs are present in the Project Area.

#### **General Effects on Visual Quality**

All harvest units under all the alternatives were designed to meet established VQOs. Some of the units are in areas visible from the Eastern Passage and Blake Channel Visual Priority Travel Routes (along other saltwater areas) and several Visual Priority Use Areas. Several of the units could potentially be noticed by the casual forest visitor but would still meet the relevant VQO. The proposed units would be located at least 0.5 mile from the closest edge of the Eastern Passage Visual Priority Route corridor.

All of the visible units are located in areas with VQOs of Partial Retention. As per the Forest Plan, the units in areas with a VQO of Partial Retention could be noticeable to the casual forest visitor and still meet Partial Retention so long as they would be visually subordinate to the landscape. These proposed harvest units would be expected to meet or exceed this criterion.

The prescriptive standard for tree retention or removal in the EIS is based on a percentage of the volume of the original stand. For example, the retention of 70 percent of a stands merchantable volume will result in leaving at least 70 percent (and likely more) of the existing trees in place. For the purpose of visual discussions that follow, reference will be made to the percentage of trees taken or left in given units.





### 3 Affected Environment and Environmental Consequences

During the IDT planning phase of the project, every effort was made to exceed the Partial Retention VQO. This was accomplished by using methods such as:

- siting clearcut units in areas not seen, or minimally seen, from Visual Priority Route and Use Areas;
- using group and individual selection harvest techniques; leaving a minimum of 70 percent of the trees behind as retention in areas with VQOs of Partial Retention that are visible from Visual Priority Travel Routes and Use Areas;
- clustering retention trees in areas that would help screen adjacent harvest activities, and
- feathering the edges of harvest units where appropriate.

Helicopter harvest was proposed in many cases to avoid the visual impacts of roads and cable harvest. Roads were also sited to take advantage of topographic features, such as knobs (that would screen them), to reduce their visibility.

The remainder of the units are in not seen areas and are only required to meet the Maximum Modification VQO. To determine where the not seen areas of the Project Area are located, the Forest Service GIS database was consulted. In addition, a seen area analysis was conducted from sensitive viewing areas to help determine what kind of prescription would be appropriate for each harvest unit. The larger not seen areas are displayed in Figure 3-5.

As discussed in the King George Timber Sale EIS (USDA Forest Service, 1996), harvest units viewed from below at oblique angles that retain 50 percent or more of the trees should not be noticed by most people. The King George EIS determined that leaving approximately 50 percent of the trees could result in some blowdown potential. The visual analysis presented in the King George EIS is hereby incorporated by reference. Leaving approximately 70 percent of the stand in this area where there is little evidence of previous large-scale blowdown should result in stands that are fairly resistant to blowdown and that would likely not be noticed.

To analyze the effects of timber harvest on the scenic quality, four representative viewpoints, or KVAs, were selected to represent several Visual Priority Routes or Use Areas. The locations of the KVAs are: the Virginia Lake Cabin (KVA 1); the Back Channel (KVAs 2 and 3); and Earl West Cove (KVA 4). These viewpoints represent the views that would be seen by the greatest number of people recreating in, or traveling through, the vicinity of the Project Area.

#### ***The Virginia Lake Cabin (KVA 1)***

This KVA is located on the deck of the Virginia Lake Cabin and represents the views that recreationists staying at the cabin would see. From the deck, the view includes the steep hillside to the north of the lake, the majority of the lake to the west and southwest and the hillsides to the south and southwest that includes the Project Area.

#### ***Alternative 1***

There would be no changes to the existing scenic conditions viewed from the Virginia Lake Cabin under Alternative 1 (Table 3-2).

Table 3-2.

**Acres Harvested by VQO in Seen Area of Virginia Lake Cabin (KVA 1) for each Alternative by Prescription<sup>1/</sup>**

KVA 1 Virginia Lake Cabin—Acres Harvested in Seen Area by Alternative							
Unit <sup>2/</sup>	Distance to Closest Visible	VQO	Acres of Unit in Seen Area				
	Part of Unit (miles)		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
V-78	1.5	PR	0	15	0	0	15
V-93	2.2	PR	0	18 (cc)	0	0	18 (cc)
V-97	1.5	PR	0	6 (cc)	0	0	6 (cc)
V-111	1.2	PR	0	69	0	0	69
V-112	1.5	PR	0	112	0	0	112
Total Clearcut Acres in Seen Area			0	24	0	0	24
Total 70% Retention Acres in Seen Area			0	196	0	0	196
Total Acres Harvested in Seen Area			0	220	0	0	220

1/ Note: cc = clearcut prescription with reserve trees. All other prescriptions are group or individual selection with 70 percent retention.

2/ Units not included in this table cannot be seen from this KVA due to screening by terrain.

### ***Alternatives 2 and 5***

Under Alternatives 2 and 5, portions of five units totaling 220 acres would be located in the seen area of Virginia Lake Cabin (Figure 3-6). Three of the units that account for 196 acres have prescriptions that would leave at least 70 percent of the trees as retention (Table 3-2). As a result, the hillsides on which these units are located would appear not to have been harvested, although they would be somewhat coarser in texture.

Units V-93 and V-97 would have prescriptions of clearcut with reserve trees. Unit V-93 is located in a valley above Glacier Creek next to Unit V-112 and would have 18 acres in the seen area. Unit V-97 is located in a relatively flat area above Unit V-111 and would have 6 acres located in the seen area. Both units are in areas with VQOs of Partial Retention. Because of the low viewing angles from the cabin and the amount of retention trees left in the parts of the seen areas closest to KVA 1, no bare ground would be visible.

Units V-93 and V-97 would meet a VQO of Partial Retention because there are other similar natural openings farther up the valley. Overall, Alternatives 2 and 5 would meet the Partial Retention VQO from KVA 1.

### ***Alternatives 3 and 4***

No units would be visible from the Virginia Lake Cabin under these two alternatives.





← Note: V-93 (out of photo)



**Figure 3-6** Photograph of View from KVA 1 (Virginia Lake Cabin) with Boundaries of Alternative 2 Harvest Units Superimposed.



## ***Eastern Passage (KVA 2)***

This KVA is located west of the center of the Eastern Passage between Mill Creek and Jenkins Cove, and represents the view that many recreationists traveling through the Eastern Passage from Wrangell would see. Many of the boats heading to Blake Channel, Bradfield Canal, or the Anan Wildlife Observatory pass through this area and would have this view of the Project Area.

### ***Alternative 1***

There would be no change to the existing scenic conditions from this portion of the Eastern Passage under Alternative 1.

### ***Alternative 2***

Fourteen harvest units would be partially located in the seen area of KVA 2 (Figure 3-7). Together these units would have approximately 392 acres in the seen area (Table 3-3).

Table 3-3.

#### **Acres Harvested by VQO in Seen Area of Eastern Passage (KVA 2) for each Alternative by Prescription<sup>1/</sup>**

##### **Eastern Passage (KVA 2)—Acres Harvested in Seen Area by Alternative**

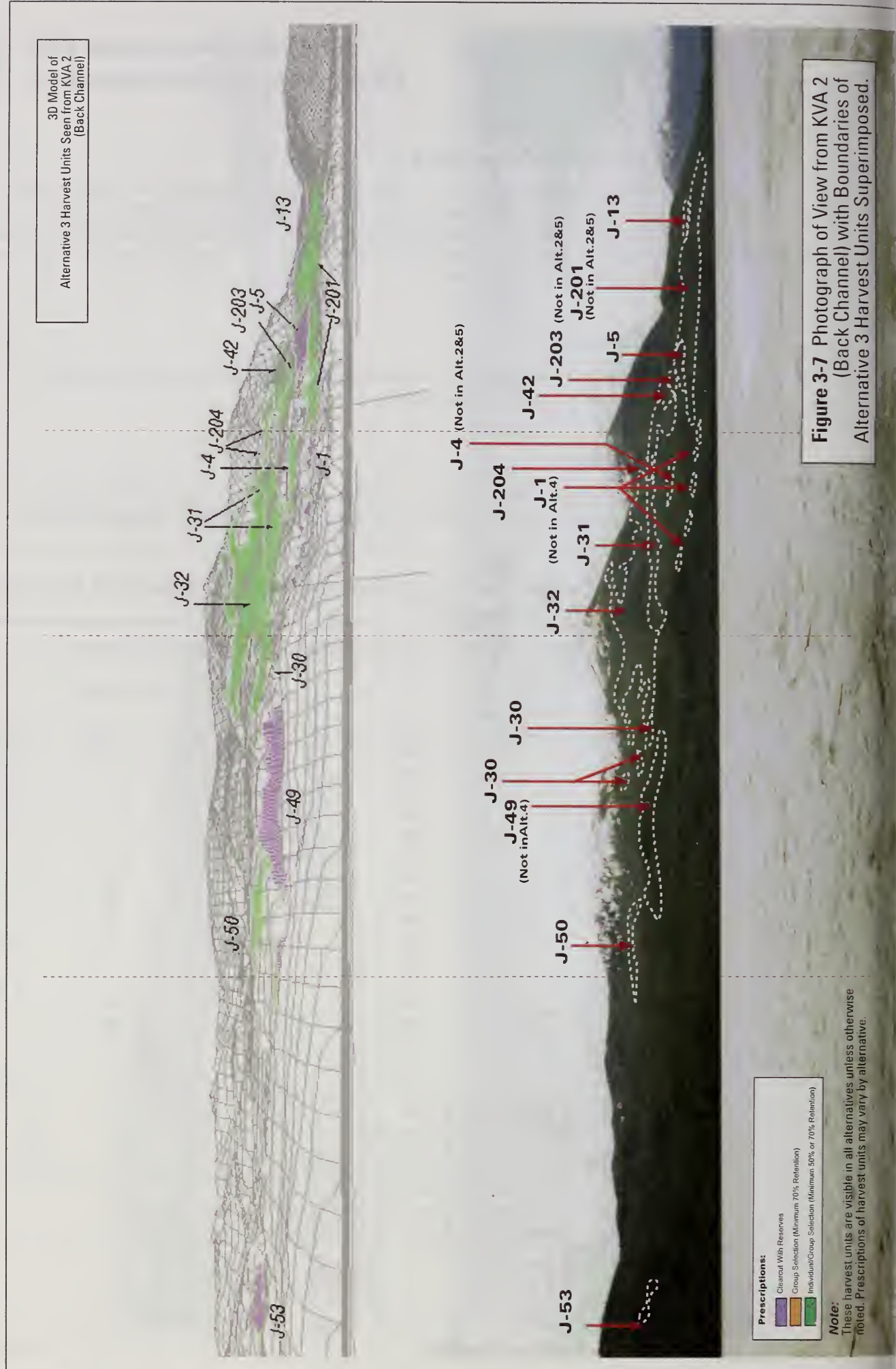
Unit <sup>2/</sup>	Distance to Closest Visible Part of Unit (miles)	VQO	Acres of Unit in Seen Area				
			Alt.1	Alt.2	Alt.3	Alt.4	Alt.5
J-1	2.2	PR	0	5 (cc)	5 (cc)	0	5 (cc)
J-5	2.5	PR	0	23 (cc)	23 (cc)	23 <sup>3/</sup>	23 (cc)
J-13	3.5	PR	0	26 (cc)	26 (cc)	26 <sup>3/</sup>	26 (cc)
J-30	2.0	PR	0	1 (cc)	1	1	1 (cc)
J-31	2.5	PR	0	65	65	65	65
J-32	2.5	PR	0	144	144	144	144
J-33	2.8	PR	0	14	0	0	0
J-36	3.2	PR	0	21	0	0	0
J-42	3.5	PR	0	47	47	47	47
J-49	1.5	PR	0	9 (cc)	9 (cc)	0	9 (cc)
J-50	1.5	PR	0	4	4	4	4
J-53	2.0	PR	0	7 (cc)	7 (cc)	0	7 (cc)
J-201	2.2	PR	0	0	108	108	0
J-203	3.2	PR	0	0	20	20	0
J-204	3.5	PR	0	0	23	23	0
V-57	2.5	PR	0	6 (cc)	0	0	6 (cc)
V-83	3.5	PR	0	20 (cc)	0	0	20 (cc)
Total Clearcut Acres in Seen Area				97	70	0	97
Total 70% Retention Acres in Seen Area				295	412	461	260
Grand Total Acres Harvested in Seen Area				392	482	461	357

1/ Note: cc = clearcut with reserve trees prescription. All other prescriptions are group or individual selection with 70 percent retention (except, see footnote 3).

2/ Units not included in this table cannot be seen from this KVA due to screening by terrain.

3/ Note that the prescription for these two units calls for 50% retention in Alternative 4.

3D Model of  
Alternative 3 Harvest Units Seen from KVA 2  
(Back Channel)





Six of the units, accounting for 295 of the 392 acres, would have prescriptions specifying a minimum of 70 percent retention. Because of the 70 percent retention and the distance from the seen portions of the units to KVA 2 (from approximately 2.5 to 3.5 miles), it would be very difficult for observers to tell that harvest had occurred.

Units J-1, J-5, J-13, J-30, J-49, J-53, V-57, and V-83 would have clearcut prescriptions with reserve trees and would, individually, have from 1 to 20 acres located in the seen area of KVA 2. The VQO of the area of these units would be Partial Retention. These units would be from 1.5 to 3.5 miles away from KVA 2 and would appear as openings in the forest canopy of varying sizes. By feathering the edges of the units and concentrating most of the 10 percent retention trees in the seen area portions of the units, it would be difficult for casual forest visitors to notice these units from KVA 2. Alternative 2 would meet the Partial Retention VQO from KVA 2.

### ***Alternative 3***

Thirteen units totaling 482 acres would be located in the seen area of KVA 2. Eight of the units, totaling 412 acres, would have prescriptions leaving at least 70 percent of the trees, and would be located in areas with a VQO of Partial Retention. As a result of the 70 percent tree retention and the distance from the seen portions of the units to KVA 2 (from approximately 1.5 to 3.5 miles), it would be very difficult for observers from KVA 2 to distinguish that harvest had occurred in these units. Units J-1, J-5, J-13, J-49, and J-53 would have prescriptions of clearcut with 10 percent tree retention and would, together, combine for 70 acres in the seen area of KVA 2. The units would appear as a number of openings of varying sizes in the forest canopy and would all be located in an area with a VQO of Partial Retention. By feathering edges and carefully leaving 10 percent of the retention trees concentrated in the seen portions of the units, all of the units would meet, and possibly exceed, the Partial Retention VQO when viewed from KVA 2.

### ***Alternative 4***

Ten harvest units totaling 461 acres would be located in the seen area of KVA 2. The effect of Alternative 4 on visual quality from KVA 2 would be slightly less than that of Alternative 3. The primary difference is that, under Alternative 4, Units J-5 and J-13 would leave 50 percent of the trees as retention, rather than the clearcut prescription of Alternative 3. Alternative 4 would meet or exceed the VQO of Partial Retention from KVA 2.

### ***Alternative 5***

Alternative 5 would have essentially the same effect on scenic quality as Alternative 2. The difference between the two alternatives is that Units J-33 and J-36 would not be included under Alternative 5 and Units J-1 and J-42 would not be under Alternative 4.

### ***The Eastern Passage Near Jenkins Cove (KVA 3)***

This KVA represents what viewers from boats traveling relatively close to the mainland would see of the Project Area off Jenkins Cove. From this location, hills behind Jenkins Cove and the beach of Jenkins Cove can be clearly seen.



### 3 Affected Environment and Environmental Consequences

#### *Alternative 1*

There would be no change to the existing scenic conditions viewed from this part of the Eastern Passage.

#### *Alternatives 2 and 5*

Portions of nine units, totaling 315 acres would be located in the seen area of KVA 3 (Figure 3-8). Four of these units totaling 260 acres, would have a group selection prescription that would have a retention rate of 70 percent (Table 3-4). These four units would be located in areas with a VQO of Partial Retention. In the flatter, lower portions of the units in the seen area, it would be very difficult to discern that timber harvest had taken place. The steeper portions of the units would have a coarser texture due to the removal of approximately 30 percent of the trees; however, Alternatives 2 and 5 would still meet the Partial Retention VQO from KVA 3.

Table 3-4.

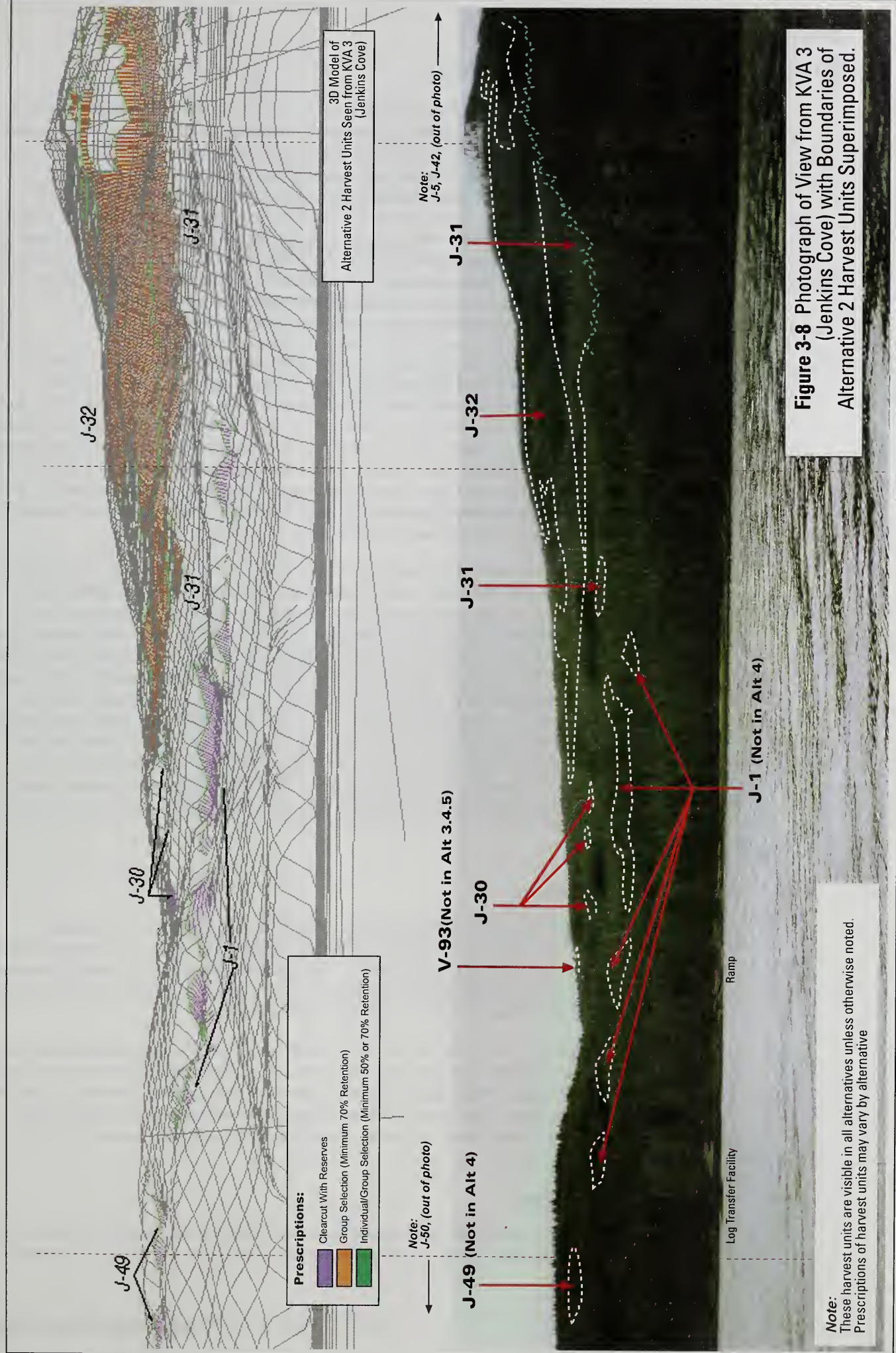
**Acres Harvested by VQO in Seen Area of Eastern Passage-Jenkins Cove (KVA 3) for each Alternative by Prescription<sup>1/</sup>**

Jenkins Cove (KVA 3)—Acres Harvested in Seen Area by Alternative							
Unit <sup>2/</sup>	Distance to Closest Visible Part of Unit (miles)	VQO	Acres of Unit in Seen Area				
			Alt.1	Alt.2	Alt.3	Alt.4	Alt.5
J-1	1.2	PR	0	5 (cc)	5 (cc)	0	5 (cc)
J-5	1.2	PR	0	19 (cc)	19 (cc)	19 <sup>3/</sup>	19 (cc)
J-13	1.5	PR	0	28 (cc)	28 (cc)	28 <sup>3/</sup>	28 (cc)
J-201	1.0	PR	0	0	106	106	0
J-204	2.2	PR	0	0	22	22	0
J-30	1.5	PR	0	1 (cc)	1	1	1 (cc)
J-31	1.8	PR	0	69	69	69	69
J-32	1.8	PR	0	160	160	160	160
J-42	2.0	PR	0	29	29	29	29
J-49	1.3	PR	0	2(cc)	2(cc)	0	2(cc)
J-50	1.5	PR	0	2	2	2	2
Total Clearcut Acres in Seen Area				55	54	0	55
Total 70% Retention Acres in Seen Area				260	389	389	260
Total Acres Harvested in Seen Area				315	443	436	315

<sup>1/</sup> Note: cc = clearcut prescription with reserve trees. All other prescriptions are group or individual selection with 70 percent retention (except, see footnote 3).

<sup>2/</sup> Units not included in this table cannot be seen from this KVA due to screening by terrain.

<sup>3/</sup> Note that the prescription for these two units calls for 50 percent retention in Alternative 4.



**Note:**  
These harvest units are visible in all alternatives unless otherwise noted.  
Prescriptions of harvest units may vary by alternative



### 3 Affected Environment and Environmental Consequences

The closest units to KVA 3 would be Units J-1, J-5, J-30, and J-49, which would all be approximately 1.25 miles away. These units would have prescriptions of clearcut with reserves and would, individually, have from 1 to 11 acres in the seen area from KVA 3. The top of the openings of these units would be somewhat noticeable from KVA 3; however, bare ground would not be visible. The units would appear as horizontal shadows in the forest canopy, not unlike the horizontal shadow areas currently visible on the hillsides. Mitigation measures such as feathering the edges of the units and leaving most of the 10 percent retention trees in the seen parts of the units would give the units the appearance of natural openings. Due to location, shape, and retention, the other visible units would blend in well with the landscape. The harvest proposed for Alternative 2 would meet the Partial Retention VQO from KVA 3.

The LTF at Jenkins Cove would be visible and would not meet the VQO of Partial Retention for the period of time the LTF was in use. The Forest Plan states that exceptions for small nonconforming developments, such as recreation sites, LTFs, and mining developments, may be considered on a case-by-case basis. The LTFs at Jenkins Cove and Moose Creek would be designed to minimize visual impacts from the Eastern Passage Visual Priority Travel Route. Both LTFs could be permanent or could be removed after harvest is completed, depending on which road management action is chosen. Similarly, the equipment ramp located farther in Jenkins Cove could remain in place or be removed after harvest is completed.

People viewing the Project Area from Jenkins Cove (KVA 3) would see the LTF and, at some angles, the equipment ramp. They would also notice ground disturbance from clearing for work areas and roads. The LTF would be designed to minimize visual impacts by screening much of the area associated with LTF development from the Back Channel with trees. The log slide, used to transfer bundles of logs to water, would be the component that would be most visible. The slide would be approximately 100 feet long and would be attached to a log crib on the upland area ending at a 30-foot by 60-foot floating platform. Log bundles would slide down the inclined slide skids to the raft until there were enough logs in the raft to sink it, thus floating the logs. The slide and raft would be removed and the cleared areas would be stabilized and rehabilitated upon completion of the sale. Within several years, disturbed areas around the ramp would be stabilized and rehabilitated, and the area around the ramp would meet a VQO of Partial Retention.

#### *Alternative 3*

Eleven harvest units totaling 443 acres would be located in the KVA 3 seen area (Figure 3-8). Seven of the units that together comprise 389 acres in the seen area would have a minimum of 70 percent retention. All of these units would be located in an area with a VQO of Partial Retention. Because of the retention of 70 percent of the trees, none of these units would be noticeable to the casual forest visitor.

Four units (J-1, J-5, J-13, and J-49) that together comprise 54 acres in the seen area of KVA 3 would have a prescription of clearcut with reserve trees. All of the units would be located in an area with a VQO of Partial Retention. With proper placement of retention trees in the most visible parts of the units, the units would meet the established VQO. Alternative 3 would meet, or possibly exceed, the VQO of Partial Retention for KVA 3.

#### *Alternative 4*

Alternative 4 would have nine harvest units within the seen area of KVA 3 (Figure 3-8). The effect on visual quality under Alternative 4 would be similar to that of Alternative 3.



The primary difference between Alternatives 3 and 4 would be that there would be no visible openings under Alternative 4. The prescriptions of Units J-5 and J-13 would be individual and group selection with 50 percent retention, rather than clearcut with reserve trees. Alternative 4 would meet or exceed the Partial Retention VQO for KVA 3.

### ***Earl West Cove (KVA 4)***

This KVA is located on the shoreline of Wrangell Island at the Earl West Cove recreation area and represents the view recreationists walking along the shore would see. Views from this point include the entrance to The Narrows (approximately 1.5 miles away), the mainland shoreline between The Narrows and Madan Bay, the Madan Peninsula, Madan Bay (the end of which is approximately 4 miles away), the Back Channel, and Wrangell Island. Lands on Wrangell Island have been harvested and are quite visible from this point.

### ***Alternative 1***

There would be no change to the existing scenic conditions viewed from this point under Alternative 1.

### ***Alternatives 2 and 5***

Four harvest units would be located in the seen area of Earl West Cove (Figure 3-9). These units would include 172 acres in the seen area of KVA 4 (Table 3-5). The closest portions of the units that would be seen from Earl West Cove would be approximately 4.5 miles away. Two of the units have a prescription calling for a minimum of 70 percent retention and have 152 acres in the seen area. Two additional units have a prescription of clearcut with reserve trees. All the units are in an area with a VQO of Partial Retention. The two units with the clearcut (with reserve trees) prescription would blend well with the landscape because of the distance to the units, the small portion of the view the units represent, and strategic placement of the 10 percent of the trees left for retention. Alternatives 2 and 5 would meet the Partial Retention VQO for KVA 4.

### ***Alternative 3***

Under Alternative 3, seven harvest units would be located in the seen area of KVA 4 (Figure 3-9). Five of the units would have prescriptions that would leave at least 70 percent of the trees as retention. These units would have 263 acres in the seen area of KVA 4. Two units (J-10 and J-13) would have a clearcut with reserve trees and would have 12 and 17 acres, respectively, located within the seen area.

### 3 Affected Environment and Environmental Consequences

Table 3-5.

Acres Harvested by VQO in Seen Area of Earl West Cove (KVA 4) for each Alternative by Prescription<sup>1/</sup>

Earl West Cove (KVA 4)—Acres Harvested in Seen Area by Alternative

Unit <sup>2/</sup>	Distance to Closest Visible Part of Unit (miles)	VQO	Acres of Unit in Seen Area				
			Alt.1	Alt.2	Alt.3	Alt.4	Alt.5
J-10	4.5	PR	0	12 (cc)	12 (cc)	12 <sup>3/</sup>	12 (cc)
J-13	4.5	PR	0	8 (cc)	8 (cc)	8 <sup>3/</sup>	8 (cc)
J-32	5.0	PR	0	25	25	25	25
J-42	4.5	PR	0	127	127	127	127
J-201	4.2	PR	0	0	43	43	0
J-202	4.2	PR	0	0	33	33	0
J-203	4.6	PR	0	0	15	15	0
Total Clearcut Acres in Seen Area				20	20	0	20
Total 70% Retention Acres in Seen Area				152	243	243	152
Grand Total Acres Harvested in Seen Area				172	263	263	172

1/ Note: cc = clearcut prescription with reserve trees. All other prescriptions are group or individual selection with 70 percent retention (except, see footnote 3).

2/ Units not included in this table cannot be seen from this KVA due to screening by terrain.

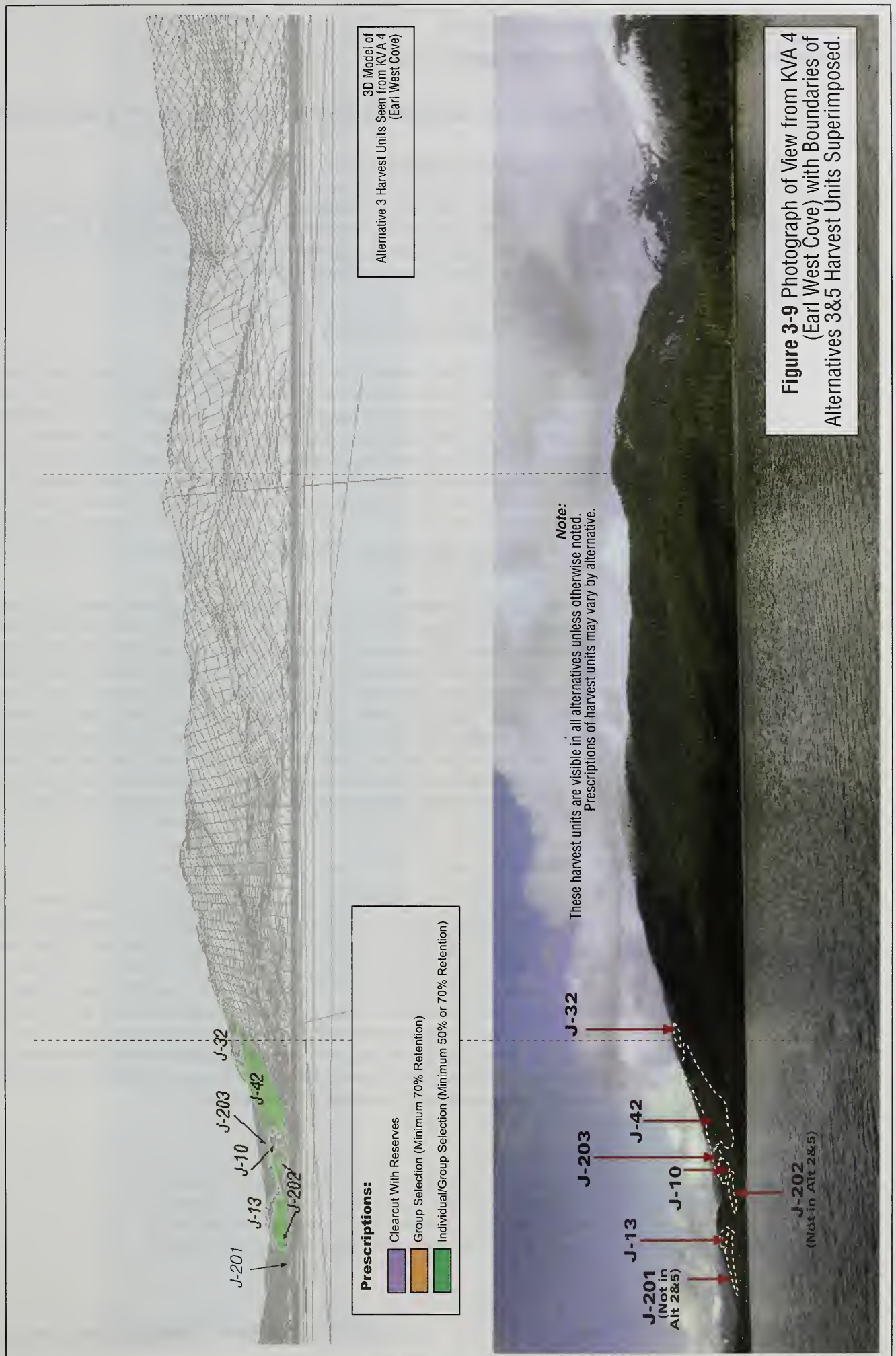
3/ Note that the prescription for these two units calls for 50 percent retention in Alternative 4.

All of the units would be located in an area with a VQO of Partial Retention. Viewers from Earl West Cove would not be able to tell that harvest had occurred in those units that leave a minimum of 70 percent retention. The two units with clearcut with reserve trees prescription (J-10 and J-13) would not be very noticeable because of the distance from Earl West Cove to the units (approximately 4.2 miles) and measures such as feathering the edges and leaving retention trees within the portions of the units in the seen area. Alternative 3 would meet the VQO of Partial Retention for KVA 4.

#### Alternative 4

Alternative 4 would essentially have the same effect on visual quality from KVA 4 as Alternative 3. The primary difference is that under Alternative 4, the prescriptions for Units J-10 and J-13 would leave 50 percent retention rather than be clearcut with 10 percent retention. Alternative 4 would meet and likely exceed the Partial Retention VQO for KVA 4.







### 3 Affected Environment and Environmental Consequences

#### *Summary of the Effects of the Alternatives on Visual Quality*

##### *Alternative 1 (No Action)*

Under Alternative 1, there would be no harvest in the near future within the Project Area and no change in scenic quality. State lands next to Mill Creek could be harvested in the near future, which would change the scenic quality of that part of the Project Area when viewed from the Back Channel and parts of Wrangell Island.

##### *Alternative 2 (Proposed Action)*

Alternative 2 is the least responsive alternative for maintaining current scenic quality, although it would still meet established VQOs. By maximizing harvest in the Virginia Lake and Jenkins Cove watersheds, some viewers would be able to notice alteration of the landscape in those watersheds. Viewers would also see changes at the Jenkins Cove LTF site because of the presence of equipment, sorting yards, and roads leading to the LTFs. Alternative 2 would rely more on clearcuts (generally in unseen areas) than the other alternatives and would also leave less retention than the others. Although many of the clearcut units would not be seen from saltwater, they would be much more noticeable from the air than the group selection and individual selection units that would be used more under Alternatives 3 and 4.

Alternative 2 would introduce harvest units into the Moose Creek watershed. Unit M-135 would be the only unit located in an area that would be visible from saltwater; however, it would not be noticeable because of a prescription of group selection, which would require retention of 70 percent of the trees in the unit. The LTF for the Moose Creek drainage would be located just to the east of the mouth of Moose Creek and would be visible from saltwater. The LTF facilities would be sited to maximize screening opportunities to reduce the visibility of the facilities from saltwater. Viewers in boats passing the LTF would, however, see the log slide, barge and some of the clearing of the road to the LTF. For the life of the project, the LTFs would not meet a VQO of Retention. After removal of the LTFs and replanting, the sites would eventually meet a VQO of Retention.

##### *Alternative 3*

Alternative 3 is the second most responsive alternative for maintaining current scenic quality. This alternative stays completely out of the Virginia Lake watershed so there would be no change to current scenic quality for viewers recreating at Virginia Lake. It would also reduce road construction near Jenkins Cove as compared to Alternatives 2 and 5. This would not have a great effect on preserving scenic quality because roads would not be very visible. Alternative 3 would primarily use individual and group selection and would leave about 70 percent of the trees for retention. The visual effect of the LTFs at Jenkins Cove and Moose Creek and their associated facilities would be the same as under Alternative 2. Although harvest would be less, the degree of visibility of harvest in the Moose Creek drainage would be similar to Alternative 2.

## ***Alternative 4***

Alternative 4 would be the most responsive alternative for maintaining current scenic quality. This alternative would stay out of the Virginia Lake watershed and would avoid clearcutting in the area above Jenkins Cove. Because of the emphasis on helicopter harvest, there would be a 0.3-mile road at Jenkins Cove that would be part of the LTF development. The LTF development would be the same as in Alternative 2 (including the equipment ramp), but would have less road near the shoreline between the LTF and the equipment ramp. The Moose Creek drainage would receive less harvest than Alternative 2 and would have slightly less effect on visual quality than Alternative 2.

## ***Alternative 5***

Alternative 5 would include the same units and roads as Alternative 2 in the areas above Virginia Lake and Jenkins Cove with the exception of Units J-33 and J-36. It would have the same effects on scenic quality in these areas as Alternative 2. Alternative 5 would stay out of the Moose Creek drainage and would have no effect on visual quality compared to existing conditions.

## ***Cumulative Effects on Scenic Quality***

When viewed from the Back Channel and locations on Wrangell Island from which the Project Area can be viewed, the various alternatives would meet established VQOs. The units would not be very noticeable to most people. The Madan sale would add to the cumulative visual effect of past harvest activities on federal and state lands on Wrangell Island for viewers in the Back Channel. Possible future harvest on federal and state lands on Wrangell Island and the mainland in the vicinity of the project would add to the cumulative effect of harvest on visual quality; however, land use policies regarding state lands in the Project Area are being re-examined and no harvest is currently scheduled.

The State of Alaska proposes harvest on Wrangell Island in the next five years, but does not plan any harvest in the Madan Project Area (State of Alaska Preliminary Five-Year Schedule of Timber Sales, 2003-2008). The State lists five units they are planning to offer on Wrangell Island, located on the opposite shore of Eastern Passage from the Madan area. Eastern Passage Units 6, 7 and 8 are proposed as 50% harvest blocks, and Units 9 and 10 are proposed clearcuts. Total estimated harvest from these five units is 3.9 MMBF. The Doughnut Timber Sale, cleared with an Environmental Assessment and Decision Notice in 2000, is also located on the Wrangell Island side of Eastern Passage. That decision authorized the harvest of approximately 4.9 MMBF from about 350 acres, most of which is partial harvest using a helicopter.

The only reasonably foreseeable project adjacent to the Project Area is the Crittenden timber sale, which lies north of the Madan Project Area on National Forest System lands; the Crittenden project is scheduled under the current Tongass 10-year action plan. Harvest in the Crittenden Project Area would not occur in the same viewsheds as the Madan sale area and would not contribute to the cumulative visual impact. The Madan sale would meet a VQO of between Partial Retention and Retention under all alternatives.

Under the current Forest Plan, harvest could potentially occur on all suitable forest lands. Because essentially all lands within the major viewsheds on the mainland in this area are managed as either Scenic Viewshed or Old-Growth Habitat LUDs and, therefore, timber harvest and road construction activities are controlled by restrictive standards and guidelines, cumulative visual effects over the long term are not expected to be significant.



### 3 Affected Environment and Environmental Consequences

#### Recreation

##### *Existing Recreation Use and Features*

There are two developed and maintained recreation features within the Project Area: the Virginia Lake Cabin and the Mill Creek Trail (Figure 3-10). As the fourth most popular cabin in the Wrangell District, the Virginia Lake Cabin is the most significant recreation resource in the Project Area. Because it is located close to Wrangell (10 air miles), the cabin gets significant use (Table 3-6 depicts the use pattern of the past 10 years). Users include people going to the lake to fish (cutthroat trout), people going simply to get away, and hunters. The cabin is especially popular with hunters during the fall moose hunting season. Because the majority of recreation use that occurs in and near the Project Area is dispersed, the only quantitative information regarding recreational use comes from overnight stays at the Virginia Lake Cabin.

Table 3-6.

##### **Use of the Virginia Lake Cabin (overnight stays) by Year, 1989-1998**

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Overnight Stays	33	37	56	65	73	52	43	66	79	89

Also popular, the Mill Creek Trail is used by people to gain access to Virginia Lake and Mill Creek above the Mill Creek waterfall, or simply as a place to hike. The 0.9-mile long trail allows foot access from saltwater to the southwest end of Virginia Lake. The small saltwater inlet below the Mill Creek waterfall is locally popular, especially for fishing.

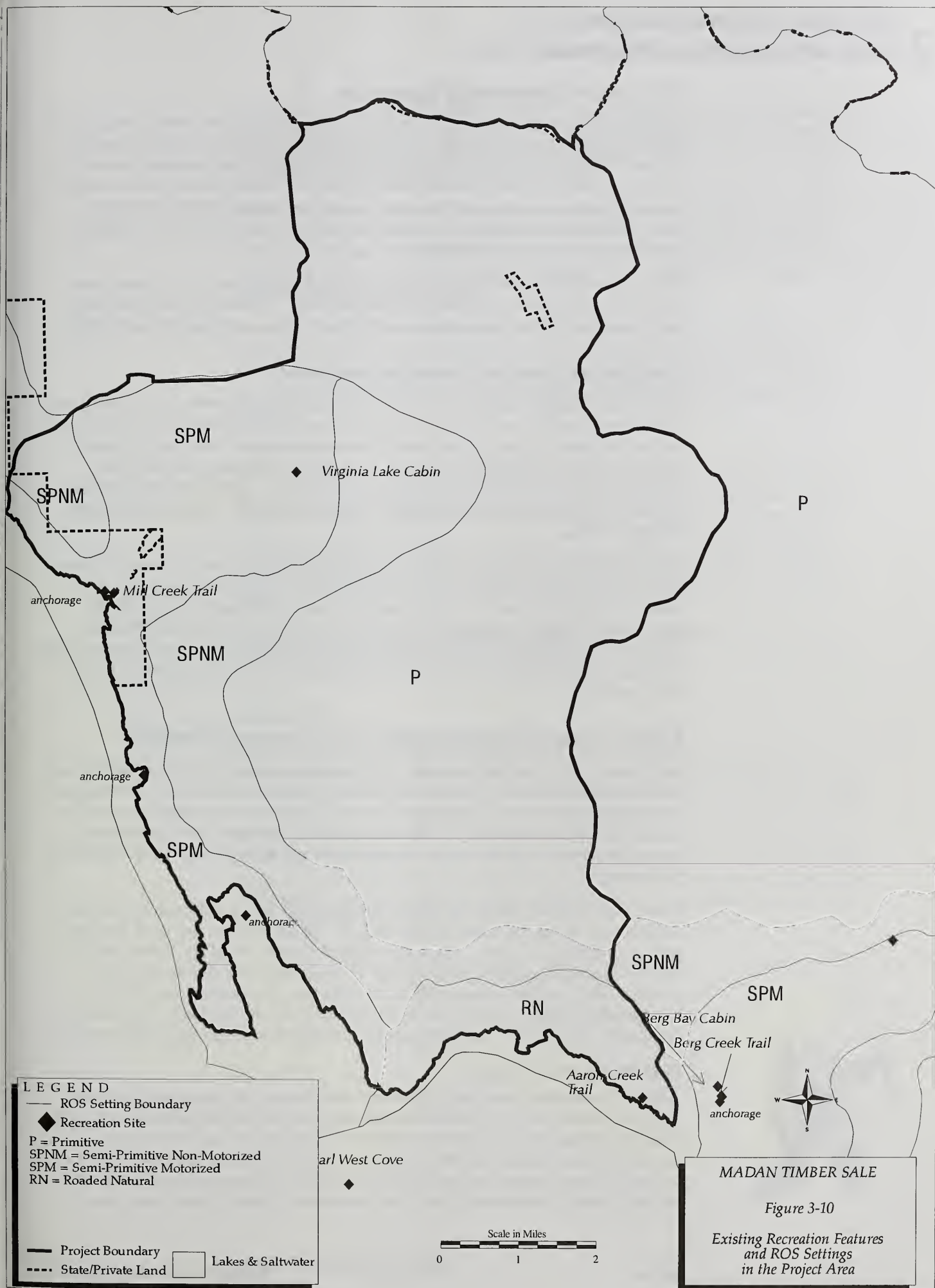
Other than the Virginia Lake Cabin and Mill Creek Trail, recreational use in the Project Area is dispersed. Most recreational use occurs along the shoreline (although there is hunting in the Virginia Lake/Porterfield Creek and Moose Creek drainages). Shoreline areas in the Project Area receive varying types and amounts of use. Madan Bay receives some use, especially from boaters who want to anchor in a protected bay. Eastern Passage (locally known as the Back Channel) and The Narrows receive use from private recreational boaters and outfitters/guides passing through to access other areas. Areas that are commonly accessed via the Back Channel include Berg Bay/Aaron Creek (and the Berg Bay Cabin), the Bradfield Canal, and recreational resources such as the Anan Wildlife Observatory, Eagle River, and the Bradfield River. Recreationists also use the Back Channel, The Narrows, and Blake Channel for saltwater fishing.

Besides the Virginia Lake Cabin and Mill Creek Trail, the closest developed recreation feature to the Project Area is the Berg Bay Cabin and the Aaron Creek Trail. Both are located approximately 1.5 miles from the southern edge of the Project Area, but are about 2.5 miles away (and hidden by a ridge) from the nearest potential Madan sale harvest unit.

Earl West Cove is a developed recreation area on Wrangell Island that contains a boat ramp and a camping/day use area. It is used for launching boats and is a popular day-use area for people from Wrangell. It is located approximately 1.5 miles south of the nearest part of the Project Area (the Madan OGR).

Forest Road 6265 is also located on Wrangell Island and is a popular road for residents to drive. The road connects Earl West Cove with Wrangell. An observation point is located at a pullover and provides expansive views of the mainland (including the Project Area) and the Back Channel.





### 3 Affected Environment and Environmental Consequences

#### ***Recreation Opportunity Spectrum***

The Forest Service developed the Recreation Opportunity Spectrum (ROS) system to help identify, quantify, and describe the variety of recreational settings available in National Forests. The ROS system provides a framework for planning and managing recreation resources. The ROS settings are classified using a scale ranging from primitive to urban. Seven elements are used to determine where a particular setting belongs on the scale: visual quality, access, remoteness, visitor management, on-site recreation development, social encounters, and visitor impacts.

The Project Area contains four ROS settings as displayed in Figure 3-10. Listed from least developed or altered to most developed, these are: Primitive (P), Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM), and Roded Natural (RN).

#### ***Outfitter and Guide Use of Project Area***

Commercial outfitters and guides use the Project Area to some extent. Use of the Project Area by local outfitters and guides includes Mill Creek Trail and the mouth of Mill Creek for sockeye salmon fishing. Guide and outfitter use of the Mill Creek Trail is limited to weekday use, and no outfitter or guide use is permitted during moose season in the Virginia Lake area (USDA Forest Service, 1997). Sunrise Aviation (the local aviation company) flies approximately one party per week to the Virginia Lake Cabin during the summer months.

Outfitters and guides use areas outside of the project more than areas within the Project Area. Areas such as Crittenden Creek (approximately 3 miles northwest of the Project Area) and Berg Bay/Aaron's Creek are used by outfitters and guides. Outfitters and guides from Wrangell do pass by the Project Area on their way to the Anan Wildlife Observatory and Bradfield Canal. On the way to or from these areas, they sometimes stop at locations in the Project Area to show clients features such as seal haulouts or the Mill Creek waterfall.

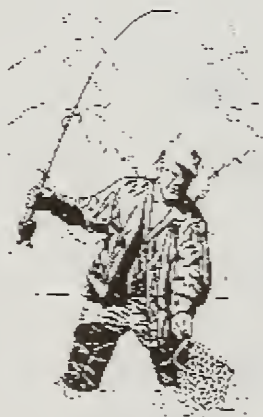
#### ***Effects of Roads on Recreational Opportunity Settings***

The Project Area is currently unroaded. Most recreational activity occurs along the coast and along the Mill Creek - Virginia Lake corridor. Because of the scarcity of developed facilities in the Project Area, recreational use is relatively light and oriented to primitive and semi-primitive recreation. The introduction of roads into the Project Area would change the current use of the area to varying extents and would change the distribution of ROS settings.

Roads, even if closed, change the remote nature of areas they pass through and change ROS settings. People use roads because they provide easier access into areas that were previously difficult to access. Although motorized vehicles would not be permitted on most roads under Road Management Option B, people would be able to walk, ride mountain bikes, and cross-country ski on the roads to access interior areas. With Road Management Option A, roads would be maintained to varying standards; some roads would allow vehicle travel and others would be limited to mountain bikes and foot traffic.

#### ***Road Management Option A***

Option A would allow motorized and non-motorized access into portions of the Project Area that currently are very difficult to reach due to the lack of established trails or roads. Under this option, roads would be maintained to allow varying kinds of recreational access. Most main roads would be maintained to encourage hiking and mountain biking and accept high clearance and non-highway vehicles (i.e., all-terrain vehicles [ATVs]). Passenger vehicles would not be able to use these roads. Many of these roads would





provide access to the uplands above Jenkins Cove and others would provide access into and above the Moose Creek drainage depending on the alternative. These roads would have destination signage at road entrances in conjunction with route markers and would be shown on Tongass National Forest visitor maps.

In addition to the main roads that would be maintained to encourage hiking (and cross-country skiing), and mountain biking, and to accept high-clearance and non-highway vehicles, short spur roads would be maintained to support hiking; other uses would be discouraged. These spur roads would be displayed on visitor maps, but would have only a route marker at the road entrance.

Because of the necessity of using boats to get vehicles and people to trailheads, it can be assumed that use of the roads would be somewhat limited, especially by motorized vehicles. Hunters would probably be the most likely to use vehicles on the roads. It is reasonable to assume that there would be more non-motorized use of the roads than motorized.

### **Road Management Option B**

Motorized access on project roads under Option B would be eliminated and hiking and mountain biking encouraged or accepted. Under this option, most main roads would be maintained to encourage hiking and mountain biking and eliminate use by motorized vehicles. In addition to the main roads, short temporary roads would be maintained to accept hiking, discourage mountain biking, and eliminate use by vehicles. Option B would result in less non-motorized use of the roads and less recreational use of roads in general.

The following paragraphs address the effects that the roads and harvest units associated with each alternative would have on ROS settings.

### ***Alternative 1***

Under Alternative 1, current recreational conditions would remain in place for the foreseeable future. The interior of the Project Area would remain difficult to access and would be an area that supported non-motorized recreation exclusively. All ROS settings would remain the same (Figure 3-10). Potential future harvest of state lands adjacent to the Project Area could result in LTFs and roads being built that would provide roaded access into areas near the Project Area, and would change the ROS settings of parts of the Project Area from unroaded to roaded (Table 3-7). In addition, state harvest might utilize the Forest Service road system for access, which would not be possible if no roads were constructed under Alternative 1.



### 3 Affected Environment and Environmental Consequences

Table 3-7.  
Changes in ROS Settings

ROS Setting	Original Acres of Settings		Acres of ROS Settings and Percent Each Setting Comprises of National Forest System Lands in Project Area							
	Alt. 1		Alt. 2		Alt. 3		Alt. 4		Alt. 5	
P	25,657	(60%)	20,158	(47%)	22,006	(51%)	21,776	(51%)	24,665	(58%)
SPNM	7,773	(18%)	8,916	(21%)	9,176	(21%)	10,274	(24%)	6,526	(15%)
SPM	7,176	(17%)	6,295	(15%)	6,200	(15%)	6,980	(16%)	5,617	(13%)
RN <sup>1/</sup>	2,197	(5%)	1,674	(4%)	1,758	(4%)	1,674	(4%)	2,197	(5%)
RM	0	(0%)	5,760	(13%)	3,663	(9%)	2,099	(5%)	3,798	(9%)
<b>Total</b>	<b>42,803</b>		<b>42,803</b>		<b>42,803</b>		<b>42,803</b>		<b>42,803</b>	

1/ Note that RN acres would decline with Alternatives 2, 3, and 4 because of the conversion of lands near the mouth of Moose Creek to RM under these alternatives.

RM = Roaded Modified

#### *Alternative 2*

This alternative would build approximately 21 miles of road in the Project Area. The high country above Virginia Lake and the area north and south of Jenkins Cove would receive approximately 15 miles of road, and the Moose Creek drainage would receive approximately 7 miles. As a result of the 21 miles of road, approximately 5,760 acres of the Project Area would be converted to an ROS of RM (Figure 3-11).

Although all roads would be stormproofed and gated or placed in storage at the completion of harvest activities under Road Management Option B, some recreationists (most likely hunters) would use non-motorized methods of transportation on the roads to access interior areas, including areas of high country, that are currently difficult to reach. If roads were left open (as under Road Management Option A) such access would be much easier and it would be more common to see use of the interior areas. Even with roads open, however, the extremely rugged nature of the terrain involved is likely to result in recreational use most often occurring near the road system in all action alternatives, with use of the system very limited under both Option A (open) or Option B (closed).

#### *Alternative 3*

Alternative 3 would result in approximately 9 miles of road being built in the Project Area. Approximately 6 miles of road would be constructed in the area near Jenkins Cove and 3 miles in the Moose Creek drainage. Roads would not be built in the Virginia Lake watershed area. The two road systems would introduce approximately 3,700 acres of RM into the Project Area (Figure 3-12). Although the road systems would not be as extensive as under Alternative 2, the roads would be used by some recreationists to access interior areas, including the high country in the upper Moose Creek watershed and above Jenkins Cove. The amount of such use is likely to be extremely limited very far from the road system because of the density of vegetation and the rugged nature of the terrain. Particularly in the Moose Creek drainage, upper slopes above the road system and harvest units are extremely steep. For these reasons, use is highly likely to be focused on the more gentle terrain near the roads and harvest units.

#### ***Alternative 4***

Alternative 4 would introduce roads into the Moose Creek watershed. Approximately 7 miles of road would be built in the Moose Creek drainage and would likely be used by people to access the interior and the high country of the upper drainage as under Alternative 2. A short 0.3-mile road and sorting yard would be built at Jenkins Cove. Harvest would stay out of the Virginia Lake watershed and harvest above Jenkins Cove would be by helicopter. Alternative 4 would introduce approximately 2,100 acres of RM into the Project Area (Figure 3-13).

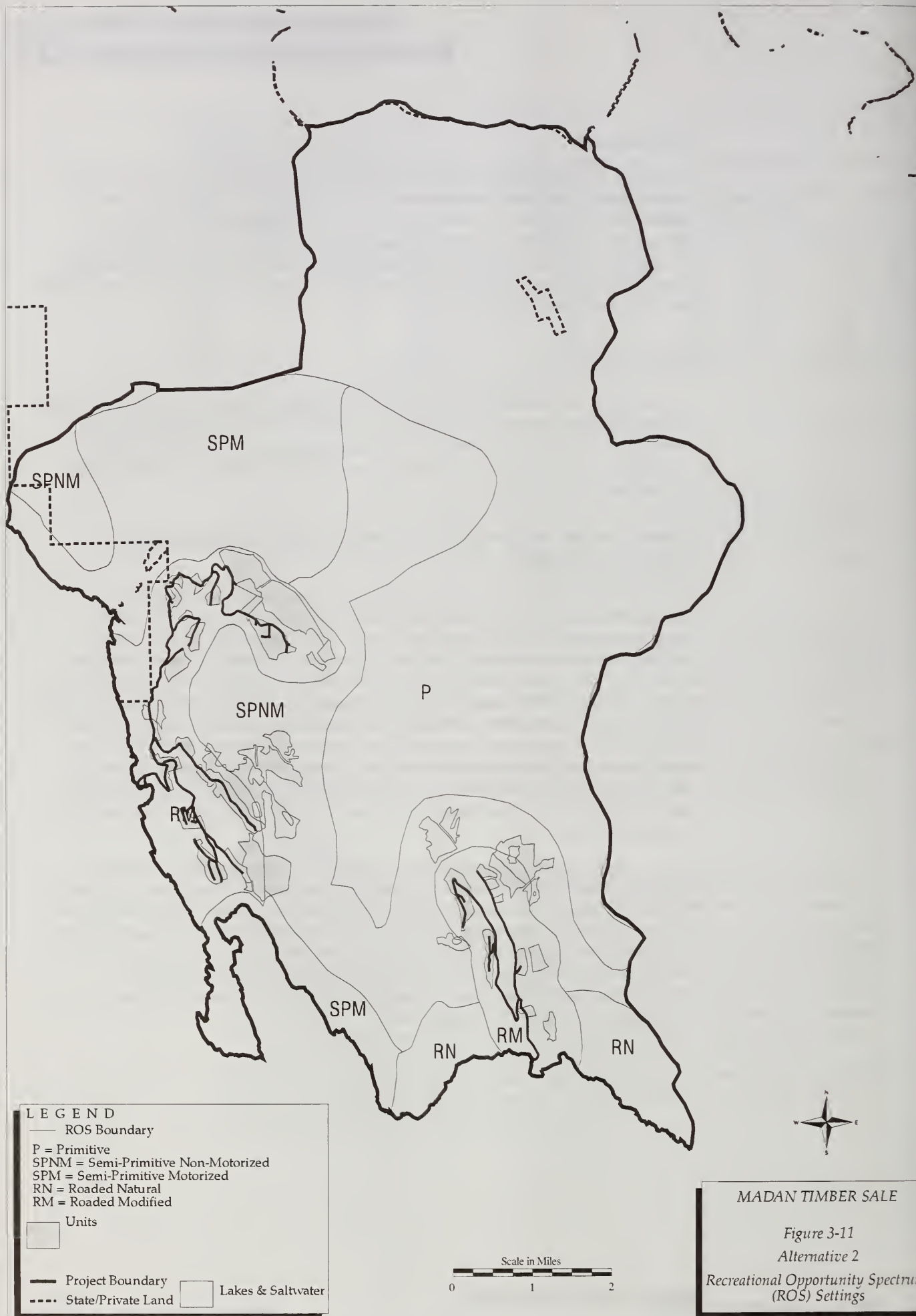
#### ***Alternative 5***

The effects of this alternative on recreation would be the same as that of Alternative 2 for all areas except the Moose Creek drainage. In the Moose Creek drainage, the effects would be the same as under Alternative 1 because there would be no harvest or road construction. Alternative 5 would introduce approximately 3,800 acres of RM into the Project Area (Figure 3-14).

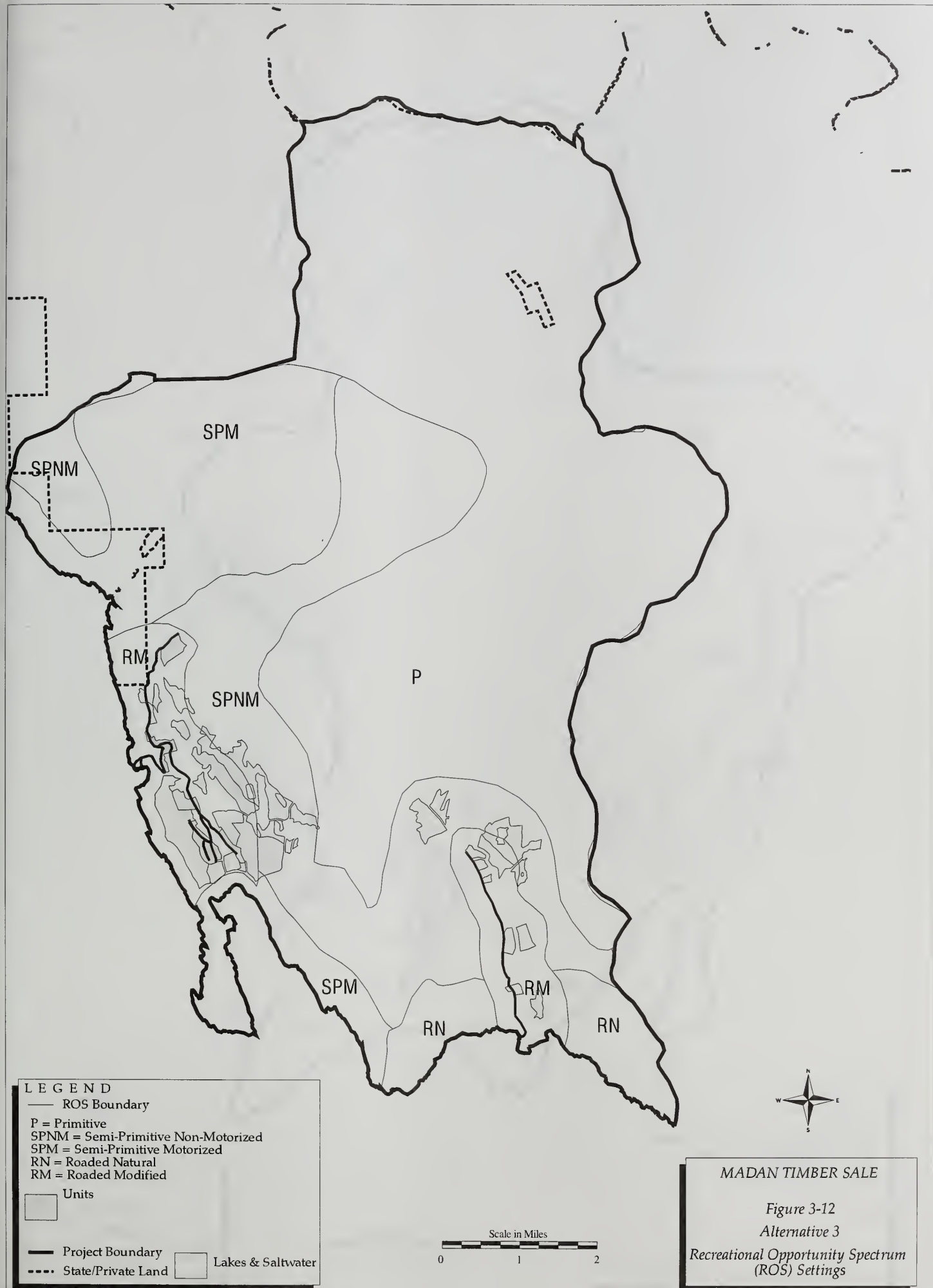
### ***Effects of the Alternatives on Recreation Experience and Outfitters/Guides***

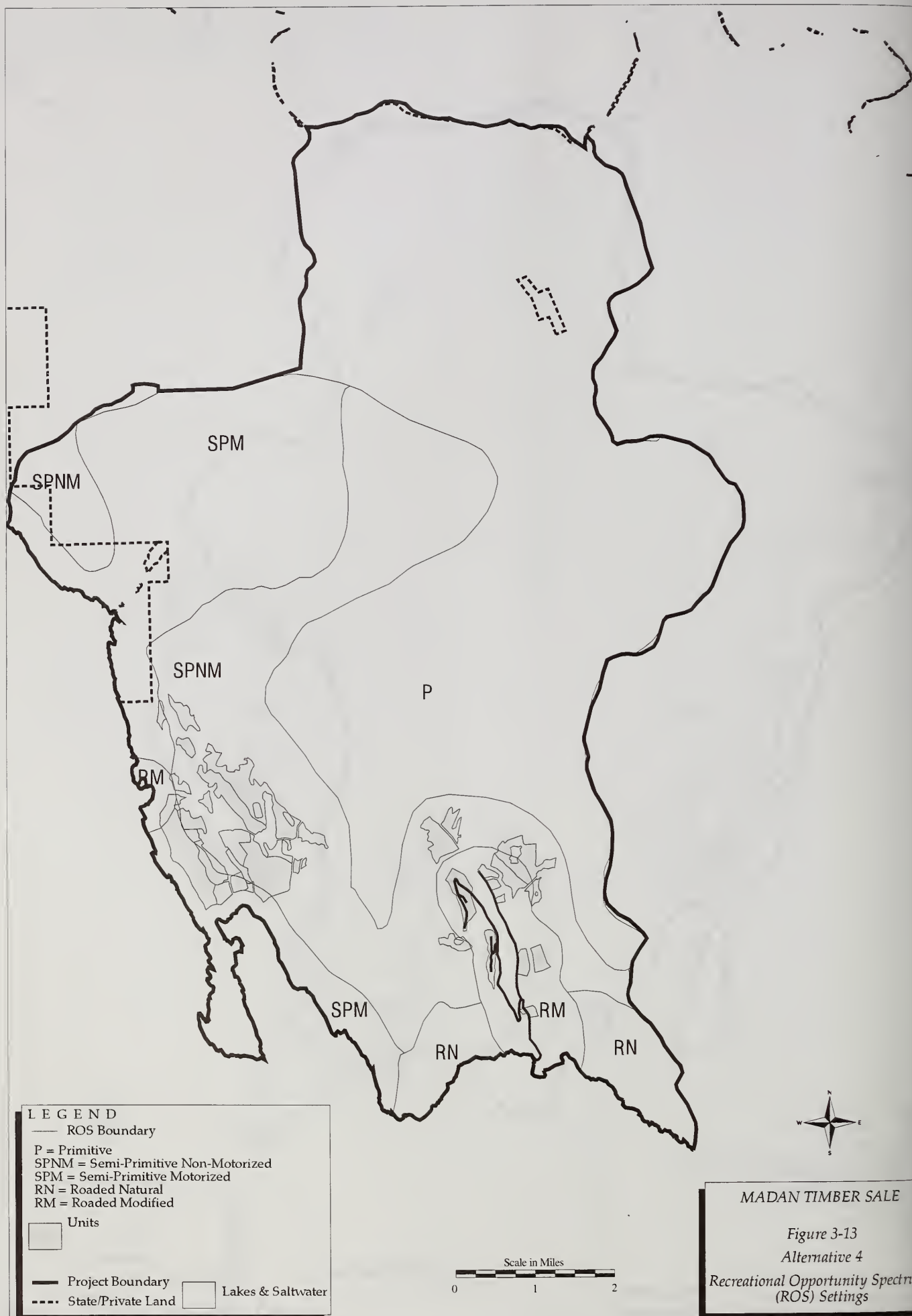
Timber harvest can have temporary and long-term effects on the quality of the recreational experience. The temporary aspect of timber harvest that would affect recreationists and outfitter/guide clients the most would be noise generated by road building and timber harvest (especially helicopter harvest) activities. Noise would be heard to varying degrees by recreationists and outfitter/guide clients over a period of 3 to 5 years. The possible expectation of a quiet, "natural," setting would be broken by timber harvest related noises. Some recreationists and outfitters/guides may choose to relocate their activities or operations out of the Project Area for the duration of harvest or may avoid certain areas for shorter periods of time. Recreationists and outfitter/guides who pass by the Project Area on their way to other areas would not likely be affected by the sale. Their clients would not likely hear harvest activities as they were being transported in motorized boats.

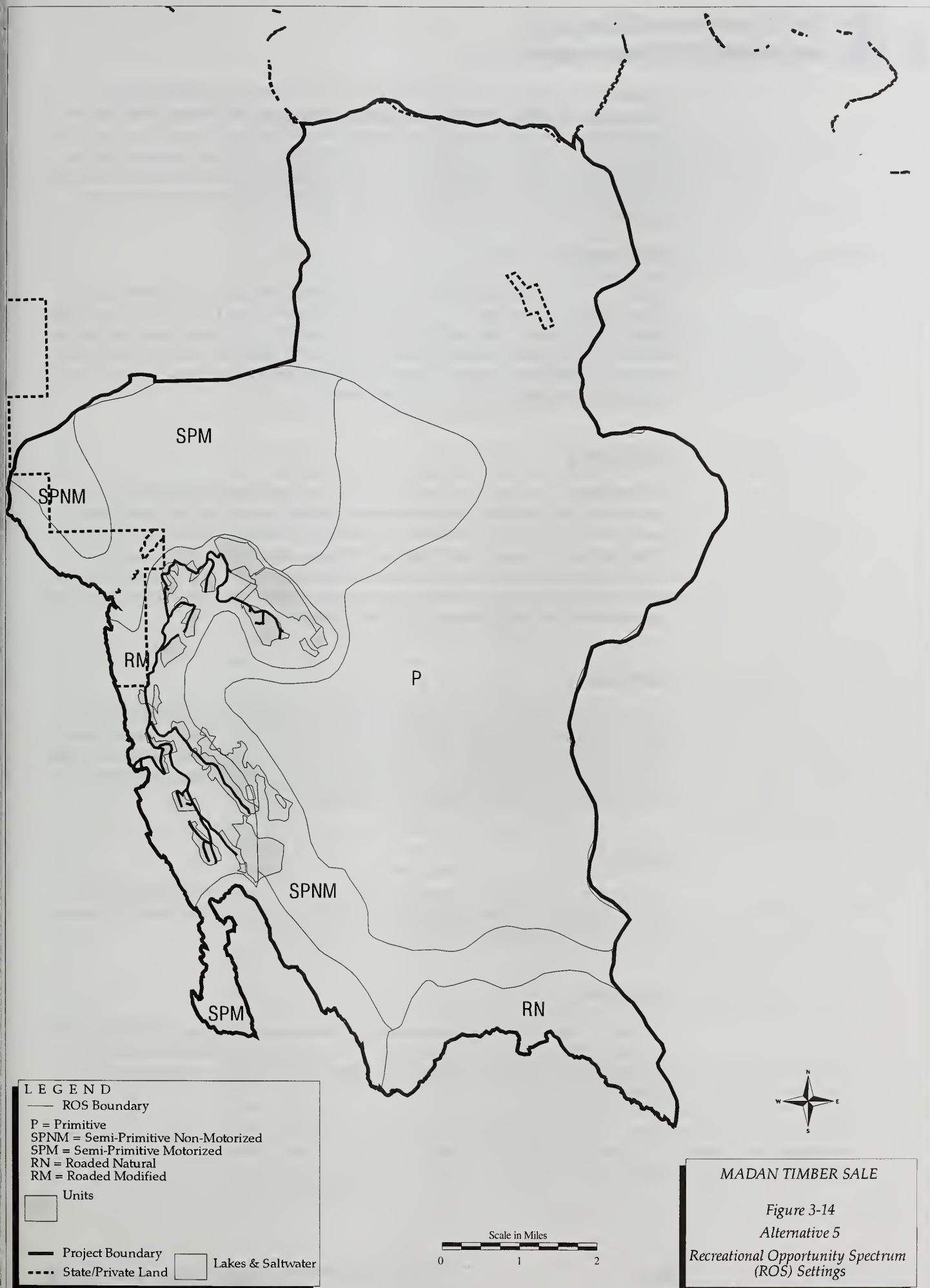
The primary potential long-term effect associated with timber harvest on recreational experiences and outfitter/guides is the change in visual quality. The quality of scenery is important to many of the recreationists that use or pass through the Project Area, as well as clients of outfitters and guides. Timber harvest units under all the alternatives would be subordinate to the surrounding landscape and may not be noticed by casual observers; such as outfitter and guide clients (see Scenery); therefore, the effects of all the alternatives on scenery should not be enough to affect the recreational experience of most recreationists or most outfitter/guide clients.













### 3 Affected Environment and Environmental Consequences

In summary, the proposed sale would have some minor, temporary effects on some recreationists and outfitter/guides, but should not have long-term or significant effects. To some recreationists, the experience and opportunity may be enhanced (see Cumulative Effects). Many people would gain the opportunity to hunt, ski, trap, hike, and bike the road system after sale development. The following sections discuss the effects that would likely occur with respect to the recreation experience and outfitter/guides under each alternative.

#### *Alternative 1*

Alternative 1 would have no effect on the recreation experience or on the clients of outfitter guides. If Alternative 1 was selected, it is possible that harvest of the state lands adjacent to the Project Area would be delayed because the state would likely rely on the Jenkins Cove LTF site and roads from it to access state lands for timber harvest. If that were the case, the visual and other effects associated with timber harvest that would occur on state lands would not occur or would be delayed.

#### *Alternative 2*

Road building and timber harvest activities would be heard by recreationists using Virginia Lake, the coastline near Jenkins Cove, Madan Bay, and the portion of Blake Channel near Moose Creek. The noise and activity generated by harvest would last for varying periods of time over the 3 (and up to 5) years of harvest. Opportunities for solitude and quiet would be temporarily lost for periods of time. The recreationists most affected would be people recreating at Virginia Lake, Madan Bay, Earl West Cove, and to some extent, people using or accessing the Berg Bay area.

#### *Alternative 3*

Because there would be no harvest in the Virginia Lake watershed, recreationists using Virginia Lake would not hear road building or harvest activities. Recreationists using saltwater areas near Madan Bay and Earl West Cove would likely hear more noise under Alternative 3 compared to Alternative 2 because harvest activities under Alternative 3 would be much more reliant on the use of helicopter.

#### *Alternative 4*

In Alternative 4, recreationists near Madan Bay and Earl West Cove would hear more noise from harvest activities compared to Alternative 2 because of the use of helicopters for harvest and the presence of a log barge at Madan Bay.

#### *Alternative 5*

The effects of this alternative on recreation would be the same as that of Alternative 2 for all areas except the Moose Creek drainage. In the Moose Creek drainage, the effects would be the same as under Alternative 1 because there would be no harvest or road construction.

### ***Cumulative Effects on Recreation Values***

The vast majority (86 percent) of the area on the mainland between the Stikine River to the north, the Canadian border to the east, and Behm Canal to the south, consists of National Forest System lands that have unroaded ROS settings (P or SPNM). Approximately 185,865 acres have an ROS setting of P and 14,252 acres have an ROS setting of SPNM, for a total of 200,117 acres of unroaded ROS settings. Up to approximately 4,360 acres of unroaded ROS settings would be changed to roaded settings as a result of the project. From a regional or cumulative perspective, this 2 percent reduction is considered to be insignificant.

The various alternatives would reduce the area of unroaded ROS settings from approximately 1,380 acres (Alternative 4) to 4,360 acres (Alternative 2). Changing the ROS settings from unroaded to roaded would decrease the amount of unroaded area along Eastern Passage and increase the amount of areas accessible by road for people willing to walk, ski, or mountain bike along the roads.

From a regional perspective, the conversion of up to 4,360 acres of unroaded to roaded ROS settings would be insignificant. From a localized perspective, the Madan sale would have a slight effect on recreation. Together with the level of timber harvest that already has occurred on federal and state lands along the Eastern Passage, the character of the Eastern Passage will become somewhat less pristine and may slightly affect the quality of recreational experiences possible along the Eastern Passage. The Madan sale would slightly contribute to the change in character of the Eastern Passage. However, because of the efforts that were taken to reduce the visual impacts of the Madan sale under all alternatives, the contribution of the Madan sale to the change in visual quality and recreation experience along the Eastern Passage would be minor. Many of the harvest units would be very difficult to see, and those that would be noticeable would meet VQOs and would be subordinate to the landscape. Compared to the harvest along the Eastern Passage on federal and state lands, the harvest associated with the Madan sale would have very little incremental effect on visual quality. The primary cumulative effect of the alternatives on recreation is that they would introduce approximately 7 to 21 miles of roads into an unroaded area. Under Road Management Option A, most of the road miles would be maintained to allow high clearance and non-highway (ATV) vehicles. Other roads under Road Management Option A, and most under Option B, would allow non-motorized access into areas that are currently without roads and developed trails and are difficult to access. The introduction of the new roads would be perceived as a negative situation by some recreationists and as a positive situation by others.

In the long term, the development of roads in the project area under Alternatives 2, 3, and 5 could increase the potential for development of additional roads to support timber harvest on state lands near Mill Creek. If this were to occur, a slight increase in road mileage within the project area would result; however, the state currently has no specific plans to conduct timber harvest on these lands, so this action is not reasonably foreseeable. Also, there is little timber available on state lands south of Mill Creek that this road system could potentially access.

The only reasonably foreseeable harvest on the mainland near the Project Area would be in the Crittenden Creek and adjacent watersheds on National Forest System lands to the north of the state lands. This area is not scheduled to be sold until 2007 and 2011 under the current 10-year action plan. Although this harvest, combined with the Madan sale, could result in a greater conversion of unroaded to roaded ROS settings, the cumulative reduction is not expected to exceed 5 percent of the unroaded area between the Stikine River and Behm Canal.

### 3 Affected Environment and Environmental Consequences

Under the current Forest Plan, harvest could potentially occur on all suitable forest lands at some point in the future. Some users would be negatively affected by additional harvest and road construction and some users would view additional road construction as beneficial to recreation. Because essentially all lands within areas of major recreation use on the mainland in this area are managed as Scenic Viewshed, Old-Growth Habitat, or Wild and Scenic River LUDs and, therefore, timber harvest and road construction activities are controlled by restrictive standards and guidelines, cumulative effects on recreation over the long term would be limited.





## Issue 2: Timber Management and Economics

The potential for the project to affect employment and the economy of local communities was brought up as an issue during public scoping. There was much concern regarding the economic viability and amount of volume in the planned sale. Public comments indicated concern about current changes in the timber industry and question the need for this sale in light of the perceived market decline. Comments ranged from voicing strong support for harvesting timber in the Project Area to questioning the need for the sale given recent mill closures in the area. The amount of wood harvested and any infrastructure developed with this entry may affect the amount of available timber and costs associated with future entries for timber harvest. Roads constructed for timber harvest may make future sales more economical, but the access they provide between sales is a concern due to other issues, such as increased vulnerability of wildlife to hunting and other disturbances.

The relationship between the proposed sale and the potentially affected communities is discussed in the Socioeconomics section of this document. The role of the Madan Timber Sale in the Tongass timber program is addressed in the Timber Supply and Demand section below and discussed in more detail in Appendix A.

### Forest Ecology and Disturbance

Four commercial tree species are common in the Project Area: western hemlock, mountain hemlock, Sitka spruce, and Alaska yellow-cedar. Based on stand exam sampling conducted in 1998, western hemlock comprises 63 percent of the suitable timber volume, Sitka spruce comprises 25 percent, mountain hemlock comprises 7 percent, and yellow-cedar comprises 5 percent. Western red cedar is also present as an occasional tree. Each of these species possesses certain characteristics that determine its location and abundance on the landscape. Each species forms plant communities or plant associations with other trees, shrubs, and forbs. The species composition of a plant association reflects the soil, climate, and disturbance history of a site. These are described in the Timber/Silviculture Resource Report (Iozzi, 1999).

The predominant agent of natural disturbance in the Project Area is wind; it occurs in two forms: small-scale and large-scale. Most of the Project Area is subject to small-scale windthrow events. Individual trees or small groups of trees blow over during windstorms, opening the canopy and allowing young trees to grow and fill the openings. Wind events capable of causing this type of blowdown occur regularly, usually in the fall or winter. The winds generally come from the southeast to southwest or from the mountains east of the Project Area. Some areas (those not protected by topographic barriers from infrequent, major storms) are also subject to catastrophic blowdown. Recent studies have documented that entire stands have blown down in Southeast Alaska (Nowacki and Kramer, 1998). The result of windthrow on the forest landscape is a mosaic of stands of different ages and types. Forest development following disturbance is described in Forest Stand Dynamics (Oliver and Larson, 1996) and is summarized in the Timber/Silviculture Resource Report (Iozzi, 1999).

All action alternatives mimic natural disturbance on two levels: the stand level and the landscape level. At the stand level, the pattern of repeated partial disturbance described



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above, would be mimicked by creating harvest units with three or more age classes of trees. These units would closely resemble the understory reinitiation stage following partial disturbance. In addition, the complete stand-replacing event would be mimicked by creating units with few trees left, moving the units to the stand initiation stage. At the landscape level, the natural patchy pattern of stands existing after windthrow events that leave some stands completely blown down, while other nearby stands are only partially blown over, would be maintained.

The tools that are available for use in maintaining natural disturbance processes at the stand level are discussed in the Forest Plan Final EIS, Appendix G (1997). This appendix lists three groupings of silvicultural systems (or ways of managing forests for clearly defined goals); they are even-aged, two-aged, and uneven-aged systems. Even-aged and uneven-aged systems are proposed under each action alternative.

#### Silvicultural Treatments

Silvicultural systems are used to tend, harvest, and re-establish forest stands. Treatments are applied throughout the life of the stand for the purpose of reaching a desired future condition. Treatments include the harvest or regeneration of the stand, intermediate cuttings, and other silvicultural treatments necessary for the replacement and development of the forest stand. No single silvicultural system can produce all desired combinations of products and amenities from a particular stand or project area. A prescription is a written record that includes treatments prescribed for the stand. Silvicultural systems can produce even-aged, two-aged, or uneven-aged stands. Only even-aged and uneven-aged systems are proposed for the Madan Project. See Appendix G of the Forest Plan EIS (USDA Forest Service, 1997b) for a detailed description of these.

#### *Even-aged Systems*

Even-aged systems produce stands that consist of trees of the same or nearly the same age. This system mimics the results of stand replacing disturbance events (USDA Forest Service, 1997) and moves units to the stand initiation stage. Clearcutting is the most commonly used method in Southeast Alaska to achieve even-aged results. The variation proposed in the Madan Project is clearcutting with reserves.

Clearcutting with reserves removes virtually the entire stand in one cutting with the exception of some reserve trees. The objective of this method is to create a fast-growing stand of mistletoe-free trees to maximize wood fiber production. At least 10 percent of the trees over 9 inches dbh would be retained as a biological legacy to improve the structural and biological diversity in the new stand. These reserve trees would generally be large, defective trees with little commercial value. They would not be managed for fiber in the next stand. Reserve trees would be unevenly distributed (e.g., in clumps or groups), their location depending largely on the capability of the yarding system. They would generally be located along unit or setting boundaries, in areas harvested with cable yarding systems. They can generally be left anywhere within the unit in areas harvested with a helicopter yarding system.

The clearcut areas are expected to regenerate naturally, as have other stands in the general area. This stand initiation stage is expected to last 20 to 30 years. A mixture of shade tolerant species, such as western hemlock and red cedar, and less tolerant spruce would become established. The regenerated second-growth stand would remain in the stem exclusion stage throughout most of the rotation, expected to be 100 to 150 years on most sites. Tree density and species composition can be adjusted by precommercial thinning to maintain a fast-growing, productive stand. Thinning can also minimize the length of time the stand is in the stem exclusion stage by delaying canopy closure. This would also



extend the period during which the stand produces forage for deer. Reserve trees would remain throughout the rotation, but some mortality is expected from blowdown and other causes.

In some units, approximately 30 percent of the unit volume would be harvested in small patches, 2 to 5 acres in size. Although a minimum of 60 percent of the unit volume would be retained, the patches would represent small clearcuts and would fall under the even-aged category. The intent of this patch-cutting approach is to have three entries, each harvesting about 30 percent of the stand volume, with 10 percent remaining as permanent retention.

Clearcutting with reserve trees and patch cutting are recommended for some units under some alternatives. Unit-specific justifications for clearcut and non-clearcut prescriptions can be found in the unit cards. When used, clearcutting is selected on a unit-specific basis in situations where: units are visually screened, and/or sized appropriately to the VQO of the area; where soils and slopes would not be adversely affected by use of the prescription; and where the prescription was appropriate to meet, or not unduly impact, wildlife, watershed, and other resource values specific to the unit being considered. When these conditions are met, and where units can be reached from the road for cable harvesting, units have a clearcut prescription to optimize regeneration potential of the site for fiber production and to optimize the economic benefit of harvest, consistent with maintenance of other resource objectives. See the unit cards in Appendix B for a summary of the conditions and objectives that have lead to the selection of the prescription for each unit in each alternative. Table 3-8 summarizes the acres proposed by prescription under each alternative.

Table 3-8.

**Proposed Silvicultural Prescription and Logging Systems (acres)**

Prescription	Silvicultural System	Logging System	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Clearcut w/reserves	Even-aged	Cable	0	719	356	283	436
Clearcut w/reserves	Even-aged	Helicopter	0	72	25	0	72
Patch Cut	Even-aged	Cable	0	0	0	0	0
Patch Cut	Even-aged	Helicopter	0	264	264	264	0
Group Selection	Uneven-aged	Cable	0	129	0	0	129
Group Selection	Uneven-aged	Helicopter	0	628	24	30	423
Individ./Group Sel.	Uneven-aged	Cable	0	0	21	0	0
Individ./Group Sel.	Uneven-aged	Helicopter	0	293	1,029	1,192	293
<b>Total</b>			<b>0</b>	<b>2,105</b>	<b>1,719</b>	<b>1,769</b>	<b>1,353</b>

### ***Uneven-aged Systems***

Uneven-aged systems are methods of maintaining a multi-aged stand with differing tree heights and layers by removing some trees in all age groups either singly, in small groups, or in patches or strips. Variations of this system would be used to harvest timber while meeting VQOs in most of the Project Area that is visible from priority use recreation areas.

Uneven-aged management techniques include removing individual trees, groups of trees, and a fixed percentage of trees in a stand. In the Madan Timber Sale, prescriptions calling for the removal of individual trees and small groups of trees (up to 2 acres) would be used (see Chapter 2). Approximately 25 to 30 percent of the merchantable volume of



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the stand would be removed in the units that have individual/group selection and group selection. The removal of 25 to 30 percent of the volume would leave more than 70 to 75 percent of the tree volume in the stand after harvest. The intent is to have three entries, each harvesting about 30 percent of the stand volume, with 10 percent remaining as permanent retention. Thereafter, future entries would harvest only second growth. In some areas that are largely not visible, up to 45 percent of the stand volume may be removed in each of two entries. The resulting stands would mimic many of the characteristics of stands that develop in areas where small-scale blowdown predominates.

The treated stands would have a high level of structural diversity, especially the individual/group and group selection harvest units. Enough of the overstory would be removed to allow younger trees to grow and seedlings to become established. Shade-tolerant species, such as western hemlock and cedar, would be favored, though spruce would grow in the larger openings.

When used, this prescription would allow for harvest on visible slopes within the Scenic Viewshed in such a way as to meet long-term visual quality management objectives while providing wood products. Due to the overstory retention of residuals and with reduced regeneration growth rates, the Forest Plan estimated reduced yields from uneven-aged management. Uneven-aged management, however, allows for harvest in the Project Area that would otherwise be difficult or impossible to screen. Uneven-aged systems in these situations allow for harvest from lands available for harvest under the Forest Plan that might not be compatible over a full rotation with VQOs if managed using even-aged systems. The unit cards in Appendix B have a unit by unit description of the basis for use of these prescriptions. Table 3-8 summarizes the acres proposed by prescription for each alternative.

### Forest Land Classification

The Project Area contains approximately 44,179 acres, consisting of 42,803 acres of National Forest System lands and 1,376 acres of state and private lands. The forests of the Project Area can be divided into a productive and an unproductive component based on the ability of specific areas to grow trees of a certain size (USDA Forest Service, 1997a). Approximately 19,379 acres, or 45 percent of the National Forest System lands in the Project Area, are covered with productive forestland. Productive forest is divided into three strata based on timber volume: high, medium, and low. The Project Area National Forest System lands contain approximately 8,575 acres of high volume late-seral forest, approximately 7,418 acres of medium volume late-seral forest, and approximately 3,386 acres of low volume late-seral forest.

Approximately 9,859 acres, or 51 percent, of the productive forestland are considered suitable for timber management. The suitable land has an estimated volume of approximately 240 MMBF. Virtually all forests in the Project Area are considered old growth; however, approximately 34 acres within the Project Area have been harvested. Most of this harvested area is within the beach fringe and is no longer considered suitable for programmed timber harvest.

Approximately 2,606 acres, representing 26 percent of the suitable forestland and 13 percent of the productive forestland in the Project Area, are being considered for harvest at this time. These 2,606 acres have an estimated volume of approximately 81 MMBF of timber. This area makes up the unit pool from which the harvest alternatives were developed.

## Proposed Timber Management

Alternative 1 would not have any direct effects on vegetation at this time. Natural processes would continue until another timber sale is planned. At that time, effects are likely to be similar to those described below. There would be no change in suitable acres because OGR boundaries would not change.

Alternative 2 would result in approximately 2,105 acres being treated (Table 3-8). Approximately 50 percent of these acres would be converted into even-aged stands. The remainder (50 percent) would be a mosaic of small openings and older forest and would continue to develop as an uneven-aged forest. Approximately 56 percent of the acreage treated would be from the high volume stratum and 95 percent would be from normal operability lands (Non-Interchangeable Component [NIC] 1) (Table 3-9). Approximately 1,124 additional acres of suitable land would be included in the expanded OGRs and would no longer be considered suitable.

Table 3-9.  
**Harvest Volume and Total Acreage Treated by Volume Strata and Non-Interchangeable Component (NIC)**

Attribute	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Harvest Volume (MBF)	0	32,169	19,053	19,491	20,646
<b>Non-Interchangeable Component (acres treated)</b>					
NIC 1	0	2,000	1,679	1,729 <sup>1/</sup>	1,353
NIC 2	0	105	40	40 <sup>1/</sup>	0
<b>Volume Strata (acres treated)</b>					
High	0	1,179	810	847	757
Medium	0	621	567	576	386
Low	0	297	338	342	204
Other	0	8	4	4	6
<b>Total</b>	<b>0</b>	<b>2,105</b>	<b>1,719</b>	<b>1,769</b>	<b>1,353</b>

<sup>1/</sup> Approximately 620 acres of NIC 1 would be managed as though it were NIC 2 because roads would not be built and harvest would be conducted by helicopter.

Alternative 3 would result in approximately 1,719 acres being treated (Table 3-8). Approximately 38 percent of these acres would be converted from mature forest to single-aged stands. The remainder (62 percent) would be a mosaic of small openings and older forest and would continue to develop as an uneven-aged forest. Approximately 47 percent of the acreage treated would be from the high volume stratum and 98 percent would be from lands with normal operability (NIC 1) (Table 3-9). As under Alternative 2, approximately 1,124 additional acres of suitable land would be included in the expanded OGRs and would no longer be considered suitable.

Alternative 4 would result in approximately 1,769 acres being treated (Table 3-8). Approximately 31 percent of these acres would be converted into single-aged stands. The remainder (69 percent) would be a mosaic of small openings and older forest and would continue to develop as an uneven-aged forest. Approximately 48 percent of the acreage treated would be from the high volume stratum and 98 percent would be from lands considered normal operability lands (NIC 1) in the Forest Plan (Table 3-9). However, Alternative 4 would manage the Jenkins Cove area using helicopter yarding only; no roads would be built at this time. As in Alternative 2, approximately 1,124 additional acres of suitable land would be included in the expanded OGRs and would no longer be considered suitable.



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Alternative 5 would result in approximately 1,353 acres being treated (Table 3-8). Approximately 38 percent of these acres would be converted from mature forest to single-aged stands. The remainder would be a mosaic of small openings and older forest and would continue to develop as an uneven-aged forest. Approximately 56 percent of the acreage treated would be from the high volume stratum and 100 percent would be from lands with normal operability (NIC 1) (Table 3-9). As in Alternative 2, approximately 1,124 additional acres of suitable land would be included in the expanded OGRs and would no longer be considered suitable (Tables 3-8 and 3-9).

#### Timber Supply and Demand

Timber demand in Southeast Alaska varies dramatically on an annual basis; therefore, the level of demand is difficult to predict with precision. Many factors influence the demand, including interest rates, housing construction, value of the dollar, import tariffs, export policies, business cycles in the United States and overseas, mill capacity, regional and world timber markets, and timber availability and cost. The timber supply and demand for the Tongass National Forest has been studied in detail (Appendix A). Appendix A explains why timber is offered for sale, expectations on market demand, and predictability, as well as other topics.

There are both short- and long-term effects for each alternative on the supply and demand of timber. The short-term effect would simply be that the volume of timber harvest would be added to the local timber supply and would, therefore, reduce the demand by that same amount. From a short-term perspective, Alternative 2 would contribute markedly more volume than other alternatives to the area timber supply. Alternative 2 would contribute 32 MMBF to the area timber supply, which is approximately 56 to 69 percent more timber volume than any of the other action alternatives.

The long-term timber supply is also affected by the percent of suitable-available acres harvested during this entry in the Project Area. The action alternatives would result in approximately 13 to 21 percent of the existing suitable-available timber being harvested. However, with implementation of any of the action alternatives, the suitable-available timber supply would be reduced by about 1,084 acres due to OGR expansion; therefore, the action alternatives would harvest from 15 to 24 percent of the new suitable-available base (Table 3-10).

Table 3-10.

#### Harvest Acres by Alternative as Percent of Suitable and Available Harvest Acres in Project Area

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Acres available for harvest <sup>1/</sup>	9,859	8,735	8,735	8,735	8,735
Treatment acres <sup>2/</sup>	0	2,105	1,719	1,769	1,353
% of suitable and available acres treated	0	24	20	20	15

1/The reduction of the suitable-available is due to the OGR expansion.

2/Treatment acres include the entire area within treatment units and do not take retention into account.

Each alternative also has potential to affect the long-term supply and demand of timber products. Road access is important to the economic feasibility of timber harvesting, and alternatives proposing more road construction provide more opportunities for future economical harvest operations (using conventional yarding techniques) and have a greater potential to contribute to the timber supply in the next entry. As a result, the effect of an alternative on the intermediate-term supply and demand can be measured by the length of permanent road construction (Table 3-11).

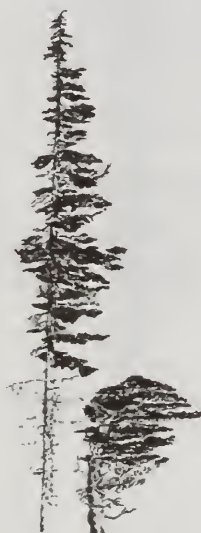




Table 3-11.

**Miles of Classified Road by Alternative**

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Miles of New Classified Road Construction	0.0	18.6	8.4	5.9	12.9

Alternative 2 has the most miles of classified roads and has the greatest potential for future contributions to the economic supply of timber in the next entry. Alternative 5 is a distant second place in terms of miles of classified road because no operations are planned in the Moose Creek Drainage.

## Timber Sale Financial Efficiency Analysis

The financial efficiency analysis displays an economic comparison among the five alternatives in the Project Area. In the analysis, the revenues of the alternatives are calculated and then the costs of producing the revenue are subtracted giving a net “stumpage” for each alternative. The financial efficiency of the Madan alternatives was analyzed two different ways; the historical high market-low market method and the Transactional Evidence Appraisal (TEA) method. The TEA method is used in the NEPA Economic Analysis Tool.

Only the high market-low market method was published in the DEIS. The TEA program was not available at that time. The TEA program is considered to be the most accurate because it uses actual setting values from recently sold Tongass timber sales. The high market-low market uses historical data dating back to 1995, where market values are considered unattainable now and into the future.

It’s important to note the high market-low market method expresses values in MBF (Thousand Board Feet). The TEA method expresses values in CCF (Hundred Cubic Feet). For purposes of simple conversion there are approximately 2 CCF units in 1 MBF unit, e.g., 1000 MBF equals 2000 CCF.

### **High Market – Low Market Method**

Each alternative was evaluated economically using a high market value and a low market value of the timber. Present selling values are relatively low and are used to represent the low market value. The high market value is represented by the prices of timber products in the second quarter of 1995. Refer to the Resource Report for a detailed explanation of the economic analysis (Urstadt and Barnhart, 1999).

The net stumpage is calculated by subtracting the costs of logging, road construction, yarding, and transporting the logs from the stump to the mill from the revenues received by selling the logs at the mill.

The main factors influencing financial efficiency in both the High-Low market and TEA analysis are:

- the logging system,
- the amount of road construction,
- the haul route,
- the species and quality of the timber,
- and the prescription.

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Tables 3-12 and 3-13 summarize timber revenues and costs to a timber operator of average efficiency, and net stumpage to the government, under the low market and the high market scenarios. Further detail is provided in Urstadt and Barnhart (1999).

Table 3-12.  
Financial Efficiency of Alternatives (Low Market Value)

Economic Factor	Alternative				
	1	2	3	4	5
Total volume (MBF) <sup>1/</sup>	0	32,169	19,053	19,491	20,646
<b>Revenues (\$/MBF)</b>					
Low market pond value (MBF) <sup>2/</sup>	0.00	124.07	116.52	115.47	140.36
<b>Cost (\$/MBF)</b>					
Stump to truck <sup>3/</sup>	0.00	221.40	273.22	296.90	219.50
Transportation <sup>4/</sup>	0.00	29.55	27.24	24.68	30.16
Temporary road construction	0.00	9.70	3.15	4.31	9.30
Specified road work and LTF costs	0.00	99.15	78.29	53.77	108.07
Profit & risk (60%)	0.00	20.25	21.45	22.73	20.28
<b>Total Costs (\$/MBF)</b>	0.00	380.03	403.35	402.38	387.30
<b>Net Stumpage (\$/MBF)</b>	0.00	(255.96) <sup>5/</sup>	(286.83) <sup>5/</sup>	(286.91) <sup>5/</sup>	(246.94) <sup>5/</sup>

1/ Does not include Right of Way (ROW) volume outside of units.

2/ The low market pond value is based on USFS 4<sup>th</sup> Quarter of 1998 values.

3/ Includes felling, yarding, sorting & loading, and general logging overhead; barge costs were added to Alt 4.

4/ Includes truck haul & delay, dump & raft, and tow to Wrangell.

5/ These figures are presented for comparison purposes only; sales would not be advertised at lower than base rates; they are negative values.

Table 3-13.  
Financial Efficiency of Alternatives (High Market Value)

Economic Factor	Alternative				
	1	2	3	4	5
Total volume (MBF) <sup>1/</sup>	0	32,169	19,053	19,491	20,646
<b>Revenues (\$/MBF)</b>					
High market pond value (MBF) <sup>2/</sup>	0.00	577.71	568.17	565.21	603.94
<b>Cost (\$/MBF)</b>					
Stump to truck <sup>3/</sup>	0.00	221.40	273.22	296.90	219.50
Transportation <sup>4/</sup>	0.00	29.55	27.24	24.68	30.16
Temporary road construction	0.00	9.70	3.15	4.31	9.30
Specified road work and LTF costs	0.00	99.15	78.29	53.77	108.07
Profit & risk (60%)	0.00	82.39	83.58	84.80	82.02
<b>Total Costs (\$/MBF)</b>	0.00	442.18	465.48	464.45	449.05
<b>Net Stumpage (\$/MBF)</b>	0.00	135.53	102.69	100.76	154.89

1/ Does not include ROW volume outside of units.

2/ The high market pond value is based on USFS 2<sup>nd</sup> Quarter of 1995 values.

3/ Includes felling, yarding, sorting & loading, and general logging overhead; barge costs were added to Alt 4.

4/ Includes truck haul & delay, dump & raft, and tow to Wrangell.

Both the low market and high market analysis tables illustrate that Alternative 5 would produce the best economic benefit, with Alternative 2 producing the next best economic benefit. All alternatives have negative stumpage values under the low market scenario and positive values under the high market scenario. These figures are presented for comparison purposes only because sales would be advertised no lower than base rates and, depending on the market at the time, they may be sold at a much higher value.

Because Alternatives 2 and 5 are similar, except for the Moose Creek area (and some long helicopter yarding in Alternative 2), it appears that the Moose Creek area is less



economical than the Jenkins Cove area. The reasons are that: (1) the Jenkins Cove option accesses the Virginia Lake area, which has higher value timber and (2) there is a higher percentage of helicopter yarding in the Moose Creek area.

Alternative 3 is the third best alternative economically. Alternative 4 ranks lowest in terms of economic benefit. The main reason for the poorer economic benefit of these alternatives is the high proportion of volume that is planned for helicopter yarding. Alternative 4 ranks lowest mainly due to longer flight distances because there is no road system to serve as landing sites in the Jenkins Cove area.

The economic difference among many of the alternatives is even more accentuated when one considers the long-term effects associated with the amount of infrastructure development on the costs of future entries. Alternative 2 would result in full development of the road system and LTFs in both the Jenkins Cove-Madan Bay, Virginia Lake, and Moose Creek areas; thus, future entries would have the lowest costs if this alternative is implemented now. Alternative 5 would be similar to Alternative 2 for the area served by the Jenkins Cove LTF; however, in the Moose Creek drainage, future entry costs would be highest because no development would occur there under Alternative 5. Alternatives 3 and 4 would have much higher future entry costs in the areas served by the Jenkins Cove LTF, compared with Alternatives 2 and 5. Costs associated with Alternative 3 would be substantially lower than for Alternative 4 because of the lack of roads to be developed under Alternative 4. In the Moose Creek drainage, future entry costs would be lowest for Alternative 4 (which would be similar to Alternative 2), slightly higher with Alternative 3, and substantially higher with Alternative 5.

When sales reflect a negative stumpage value it does not always mean they are not going to be successfully sold. There are a number of other factors that influence the market appeal of any given timber sale offer, including company viability of individual purchasers, species composition, if and how much road construction is required, distance of offering from the mill site, if the sale is being offered as a Small Business sale or as an Open sale, percent of defect, and purchaser log inventory, as well as other considerations relative to each individual purchaser. While several sales on the Wrangell Ranger District have appraised as deficit sales over the last 3 years, each and every sale offering has sold. The High/Low market value comparison is just a way of displaying relative differences between the alternatives.

### ***Additional Financial Efficiency Analysis (TEA & NEAT)***

The Forest Service recently developed a spreadsheet model, the NEPA Economic Analysis Tool (NEAT), to evaluate the economics of proposed timber sales in Region 10. A preliminary financial appraisal was conducted for the Madan action alternatives using NEAT. The NEAT analysis provides a different approach to evaluating financial efficiency than the preceding analysis, which was prepared as part of the Draft EIS process, and offers an additional source of information for the decision-maker and the public to consider. This section provides a brief overview of NEAT and presents the results of the analysis.

NEAT is based on the Forest Service's Transactional Evidence Appraisal (TEA) system. The TEA system calculates the expected bid for a timber sale alternative based on the weighted average timber values and logging and road building costs used in the High-Low analysis from the last 10 timber sales sold, adjusting those values to account for differences between the weighted average and the proposed sale alternative. The value of the timber is calculated and then adjusted to account for logging and road costs. The model calculates expected bid rates for the current and 25 preceding quarters. These market scenarios and the corresponding range of values are used to display the cyclical



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nature of timber markets. They are not intended to represent a final appraised stumpage value.

Volumes were calculated by the NEAT model based on project-specific field stand exam data. Estimated harvest volumes are presented by alternative, species, and volume strata in Table 3-14. These estimates differ from the estimates made in the field (see Tables 3-16 and 3-17) and are also expected to vary from actual cruise volumes used later for the timber sale contract. Note that NEAT estimates volumes and values in CCF (hundred cubic feet). For the purposes of analysis, there are assumed to be two CCF per MBF on the Tongass.

**Table 3-14.**  
**Estimated Harvest Volumes by Action Alternative, Species, and Volume Strata**

Volume Strata/Species (CCF)	Alt. 2	Alt. 3	Alt. 4	Alt. 5
<b>High</b>				
Sitka Spruce	8,837	4,899	5,157	5,203
Hemlock	28,231	14,302	13,509	14,303
Alaska Yellow Cedar	529	252	293	298
<b>Medium</b>				
Sitka Spruce	1,477	1,418	1,236	1,061
Hemlock	8,468	7,844	6,027	5,871
Alaska Yellow Cedar	386	353	279	265
<b>Low</b>				
Sitka Spruce	1,096	633	894	479
Hemlock	6,196	3,600	4,221	2,691
Alaska Yellow Cedar	388	197	329	164
<b>Total (High, Medium, Low)</b>				
Sitka Spruce	11,410	6,951	7,288	6,742
Hemlock	42,895	25,745	23,757	22,864
Alaska Yellow Cedar	1,303	802	900	727
<b>Grand Total (All Species)</b>	<b>55,608</b>	<b>33,497</b>	<b>31,946</b>	<b>30,333</b>

1/ There would be no Western Redcedar harvested under any of the alternatives

2/ These estimates differ from the estimates made in the field (see Tables 3-14 and 3-15) and are also expected to vary from actual cruise volumes used later for the timber sale contract.

3/ NEAT estimates volumes and values in CCF. For the purposes of analysis, there are assumed to be two CCF per MBF on the Tongass.

4/ These estimated volumes assume a 12-inch utilization standard.

Estimated harvest volumes by species, logging costs, and expected bid values are presented by alternative in Table 3-15. These estimates are based on current market conditions (June 2002) and assume an operator of average efficiency and a 12-inch utilization standard. Estimated bid values per CCF under these conditions range from -\$31.87 (-\$63.74/MBF) under Alternative 2 to -\$54.79 (-109.58/MFB) in Alternative 4.

The estimated harvest volumes, expected values, costs to an operator, and net stumpage values presented in this document are not definitive figures. These estimates are useful for comparing the alternatives but should not be used for determining actual sale volume costs or values. Merchantable timber within units and any road right-of-way located on National Forest System lands will be cruised to determine the quantity, quality and value for the contract under which that volume of timber is offered. The final sale appraisal will include current quarter selling values, current cost information, and a normal profit

Table 3-15.

**Financial Efficiency of Alternatives (NEAT Analysis)**

Species/Cost/Expected Bid	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Spruce Sawlogs	11,410	6,951	7,288	6,742
Hemlock Sawlogs	42,895	25,745	23,757	22,864
Alaska-cedar Sawlogs	1,303	802	900	727
Western Redcedar Sawlogs	0	0	0	0
<b>Total</b>	<b>55,608</b>	<b>33,497</b>	<b>31,946</b>	<b>30,333</b>
Logging Cost (\$/CCF)1/	157.23	170.21	187.87	165.06
Expected Bid (\$/CCF)2/	-31.87	-46.57	-54.79	-37.35
<b>Expected Bid Total (\$000s)</b>	<b>-1,772</b>	<b>-1,560</b>	<b>-1,750</b>	<b>-1,133</b>

**Note:**

1/ Logging costs calculated by the NEAT model include stump-to-truck; haul, transfer, raft, and tow; road construction and maintenance; and unusual costs. Logging costs are one factor used to estimate potential bid values.

2/ The estimated bid value is calculated for each alternative based on project-specific characteristics. The estimated bid values used in this analysis are current bid values calculated using data from June 2002.

3/ This analysis assumes a 12-inch utilization standard.

and risk allowance to determine the minimum advertised stumpage value at the time of offering. It should be noted that base rates to cover the costs of essential reforestation and a small return to the National Treasury would be the minimum rates advertised for sales appraised as deficit. Competitive bidding will determine the actual value.

Expected bid values are displayed for each action alternative for the last 25 quarters in Figure 3-15. The basic curve followed by all five alternatives reflects the market conditions over the past 3 years. The bold black line near the top of the chart shows the base rate, the minimum rate the Forest Service will accept for timber. Expected bid rates below this line are not expected to sell under market conditions. Market prices may, however, vary enough to produce a positive sale in future years. Market swings could show numbers in the range of -\$30/CCF today and still reach a positive stumpage value at time of sale.

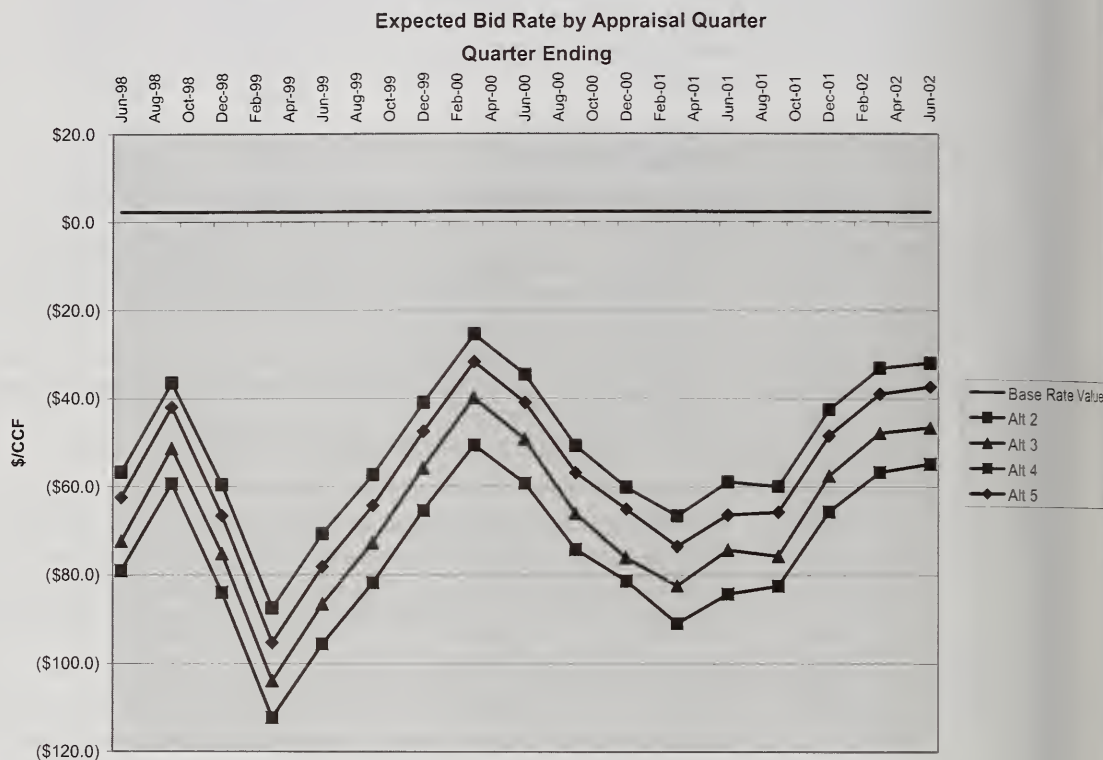
## Public Investment and Projected Employment

The following public investment analysis is based on the projected harvest volumes and high market net stumpage values from Table 3-13. The average Region 10 allocation costs and management expenses are subtracted from net stumpage revenues to determine net value. The costs and management expenses include NEPA planning, sale preparation, harvest administration and engineering support. The estimated costs and net value of each alternative are displayed in Table 3-16.

Analysis of the high market indicates that all but two alternatives would generate a negative monetary return to the public. The range is from -\$1.3 million for Alternative 1 to +\$1.1 million for Alternative 2. The range in net value correlates to the volume harvested and the costs to implement, prepare, and administer these alternatives. The main reasons that three of the alternatives have negative values are related to the species present and the road costs. The majority of the timber volume is hemlock (which has relatively low value), not Sitka spruce or Alaska yellow-cedar (which have higher values). Western and mountain hemlock make up from 72 to 76 percent of the volume in each

### 3 Affected Environment and Environmental Consequences

Figure 3-15  
Expected Bid Rate by Appraisal Quarter (12-inch Utilization Standard)



alternative, with Alternative 5 having the lowest hemlock percentage and Alternative 3 the highest. Sitka spruce represents from 20 to 22 percent of the volume in each alternative; Alternative 3 has the lowest proportion of Sitka spruce and Alternatives 2 and 5 have the highest. Alaska yellow-cedar comprises from 3 to 6 percent of the volume in each alternative; Alternative 4 has the lowest proportion of yellow-cedar and Alternative 5 has the highest. Also, specified road construction is treated as a direct cost of logging instead of being treated as an asset that can increase future harvest values.

Although Alternative 1 is the No-Action Alternative, it has a negative return due to the NEPA investment costs. The NEPA cost is the same for each alternative and based on the volume of Alternative 2. The net values of all alternatives are expected to be less than the returns from future harvest entries that could use the road system constructed under these alternatives. Alternative 2 is the only alternative that creates both the Jenkins Cove and Moose Creek LTF sites and road systems and would, therefore, contribute the most to future harvest revenues. Because Alternative 3 would also develop both LTF sites, but fewer roads, it would contribute less to future revenues than Alternative 2. Alternatives 4 and 5 would contribute less than Alternative 3 because these alternatives only develop one LTF and one road system. Alternative 1 would contribute nothing to future harvest revenues.



**Table 3-16.**  
**Public Investment Analysis by Alternative**

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
<b>Volume (MBF)</b>	0	32,169	19,053	19,491	20,646
<b>Revenues</b>					
“High” market stumpage value	\$0	\$4,359,855	\$1,956,517	\$1,963,979	\$3,197,880
<b>Costs</b> <sup>2/</sup>					
NEPA <sup>3/</sup>	\$1,318,917	\$1,318,917	\$1,318,917	\$1,318,917	\$1,318,917
Sale preparation	\$0	\$739,880	\$438,216	\$448,297	\$474,853
Sale administration	\$0	\$289,518	\$171,476	\$175,420	\$185,812
Engineering support	\$0	\$900,724	\$533,480	\$545,752	\$578,082
Total costs	\$1,318,917	\$3,249,040	\$2,462,089	\$2,488,387	\$2,557,664
<b>Net value</b>					
“High” market value	(\$1,318,917)	\$1,110,815	(\$505,572)	(\$524,408)	\$640,216

1/ Net stumpage value from Tables 3-12 and 3-13. Only high market is used for comparison because low market stumpage values are below base rates.

2/ Forest Service costs per MBF based on the Region 10 average budget allocation of:  
\$41/MBF for NEPA  
\$23/MBF for sale preparation  
\$9/MBF for sale administration  
\$28/MBF for engineering

3/ The NEPA costs are estimated using the volume in Alternative 2, but would be the same regardless of the alternative selected.

Value in parentheses ( ) are negative.

The proposed Madan Timber Sale would play an important role in the overall Tongass National Forest sales program, helping to meet market demand for timber and retain existing employment levels. The proposed action alternatives would generate between 101 job-years (Alternative 3) and 170 job-years of direct employment (Table 3-17).

**Table 3-17.**  
**Projected Employment by Alternative**

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
<b>Volume (MBF)</b>	0	32,169	19,053	19,491	20,646
<b>Estimated Job-Years</b>	0	170	101	103	109

1/ Based on 3.33 sawmill and 1.95 logging jobs created per MMBF. Road construction jobs are included in this figure (USDA Forest Service, 1997b, Table 3-145). Total jobs produced are estimated at 5.28 per MMBF.

2/ Job-year estimates represent one year of logging or sawmill employment. This employment would not all occur in one year and estimated job-years do not directly translate into numbers of affected workers.

These employment impacts would not all occur in one year and estimated job-years do not directly translate into numbers of affected workers.

The job-year estimates presented in Table 3-17 are for logging and sawmill jobs only. They do not include indirect or induced employment impacts. Indirect impacts occur as a

### **3 Affected Environment and Environmental Consequences**

result of the logging and sawmill sectors purchasing inputs from other industries in the area. Induced impacts occur as a result of spending in the local economy from earnings created by the direct and indirect impacts. While it is likely that there would be indirect and induced impacts associated with the action alternatives, these types of impacts are difficult to accurately quantify. Indirect and induced impacts are not estimated here but it is reasonable to assume that they would be generally proportional to the direct impacts, with the largest impacts occurring under Alternative 2.

#### **Opportunities for Small Sales**

Small sale opportunities are an issue that responds to the desire to have small timber sales for local operators. Generally these sales are to be harvested with a conventional yarding system (preferably shovel) to an existing road. Since there are no existing roads in the Project Area, there are currently no opportunities for small sales.

Under the action alternatives, opportunities for small sales would be created within the Project Area. The decision regarding the size of sales and how many sales to offer from a project is an administrative decision that is made on an annual basis after the ROD is signed. The decision is based on the current market and the demand for timber. To facilitate the development of competitive markets, the Forest Service and the Small Business Administration agree on an annual set-aside goal for the Tongass National Forest (USDA Forest Service, 1997b: p. 3-291). Because small sales normally do not involve helicopter yarding, the greatest opportunities with small sales would occur with Alternatives 2 and 5.

#### **Cumulative Effects**

The Forest Service does not have any other timber activities planned for the Project Area in the foreseeable future and past timber management has been virtually non-existent (34 acres near the mouth of Moose Creek were logged in 1959). While there are no plans to re-enter the Madan Project Area in the near future, consideration will be given to salvaging future blowdown that may occur. These types of salvage activities typically yield less than 5 MMBF. The only planned timber harvest on the mainland near the Project Area is the Crittenden timber sale, with an estimated 40 MMBF projected for harvest in the most recent Tongass 10-year action plan. The Crittenden project lies north of the state land that occurs along lower Mill and Crittenden Creeks.

Although the State of Alaska owns lands both south and north of Mill Creek there are no timber management plans for these areas in the immediate future. The State of Alaska's Preliminary 5-year Schedule of Timber Sales (2003-2008) does list five units they are planning to offer on Wrangell Island, located on the opposite shore of Eastern Passage from the Madan area. Eastern Passage Units 6, 7 and 8 are proposed as 50% harvest blocks, and Units 9 and 10 are proposed clearcuts. Total estimated harvest from these five units is 3.9 MMBF. The Doughnut Timber Sale, cleared with an environmental assessment and Decision Notice in 2000, is also located on the Wrangell Island side of Eastern Passage. That decision authorized the harvest of approximately 4.9 MMBF from about 350 acres, most of which is partial harvest using a helicopter.

Though no activities are planned for the next 5 years, state lands south of Mill Creek could more easily be developed under Alternatives 2, 3, and 5, since these alternatives all develop the Jenkins Cove LTF and road network. Therefore, these alternatives could provide more opportunities for economic development in the future. However, the acreage of state lands south of Mill Creek that would be considered suitable for timber harvest under the State Forest Practices Act is relatively small (<100 acres).

Under the current Forest Plan, harvest could potentially occur on all suitable forest lands. In the Madan Roadless Area (which includes the Madan Project Area), there are approximately 11,386 acres of National Forest System land that are estimated to be suitable for timber production under the Forest Plan (given estimated falldown and scheduling factors), and could be harvested over the long term (USDA Forest Service, 2003).



## Issue 3: Wildlife Habitats and Species of Concern

The conservation of biological diversity incorporates two strategies for addressing both individual species as well as entire ecosystems (Marcot et al., 1994). The traditional species-by-species approach is important for featured Management Indicator Species (MIS), and sensitive or threatened and endangered species. This strategy relies on avoiding harvest in important habitats for selected species and using silvicultural practices to provide for species habitat, such as retaining snags and green trees within harvest units.

The second strategy focuses on conserving the entire ecosystem by facilitating the maintenance of a functional and interconnected natural forest mosaic. This, in part, relies on a system of reserves to ensure the maintenance of viable, well-distributed populations. Maintaining corridors between reserves and managing the “matrix” or habitat between the reserves adds to the strategy.

The location and density of roads has an effect on certain wildlife species. Roads can act as dispersal barriers to small mammals and amphibian populations. Roads on the mainland will provide interior access to game animals and furbearers that are currently only accessed by shore. The area along the shoreline between The Narrows and Crittenden Creek (just north of the Project Area) contains high value deer winter range relative to what is available throughout the Project Area. This same area serves as a forested connection between the two small OGRs. Some commenters have stated that Moose Creek has importance as habitat for moose and mountain goat populations.



### Wildlife Habitats

Habitat provides the essentials—food, water, and cover—that a species must have to survive and reproduce successfully. Wildlife species are known to select habitat in accordance with certain criteria that relate to microclimate, physiography (slope, elevation, aspect), prey densities, protection from predators, and a variety of vegetative features. Wildlife habitats in the Project Area are described using data contained in the Forest Service GIS layers. The GIS database was developed based on timber stand exams, aerial photo interpretation, and field studies. Some data layers were corrected based on site visits. Wildlife habitats in the Project Area include beach fringe, wetlands, riparian areas, old-growth forest, and other non-forest habitats.

Wildlife habitats are created and influenced by complex interactions of biotic (living) and abiotic (non-living) factors that operate on multiple scales. For example, the Project Area falls into the Eastern Passage Complex of the Ecological Subsections of Southeast Alaska (Nowacki et al., 2001). The “ecological subsection” designation represents a mid-sized terrestrial ecosystem (10-1,000 mi<sup>2</sup>) that can be characterized by certain common environmental attributes such as physiography, lithology (the physical character and description of a rock or outcrop), and surface geology. These factors affect the patterns, processes, and productivity of terrestrial and aquatic systems in Southeast Alaska (Nowacki et al., 2001).

This particular mainland subsection is characterized by complex sedimentary and volcanic surfaces, rough topography, and moderately high rainfall. Glaciation has resulted in a landscape of rounded ridge-tops, steep sidewalls, and a general absence of glacial till. Alpine areas comprise approximately 30 percent of the land area, wetlands cover approximately 20 percent, and the remaining 50 percent contains hemlock or hemlock-spruce forests. Southwesterly and northeasterly aspects are most common.

Drainage, aspect, and elevation influence the mixture of forest types found across this area (Nowacki et al. 2001).

## ***Beach and Estuary Fringe***

### ***Affected Environment***

Beach and estuary fringe represents the area within 1,000 feet of the coastal zone that is transitional between land and water, salt and fresh water, and vegetated and non-vegetated conditions. Forested areas in this transition zone typically receive high use by species with high economic, recreational, subsistence, and esthetic values including black bear, river otter, bald eagle, black-tailed deer, and Vancouver Canada goose. Many of these species are abundant in mature and old-growth stands. Approximately 6,343 acres of beach and estuary fringe occur in the Project Area (Table 3-18).

**Table 3-18.**  
**Acres of Wildlife Habitat in the Project Area and in the Harvest Units of Each Alternative<sup>1/</sup>**

Habitat Type <sup>2/</sup>	Project Area	Alternative			
		2	3	4	5
Productive Old Growth <sup>3/</sup>	19,379	2,098 (50%) <sup>1/</sup>	1,715 (62%) <sup>1/</sup>	1,765 (69%) <sup>1/</sup>	1,353 (62%) <sup>1/</sup>
Beach and Estuary Fringe <sup>4/</sup>	6,343	0	0	0	0
Riparian <sup>5/</sup>	2,663	0	0	0	0
Alpine/Subalpine	4,351	0	0	0	0
Ice/Snow Fields	332	0	0	0	0
Slide zones <sup>6/</sup>	3,714	25	25	25	0
Wetland <sup>7/</sup>	7,872	360	424	419	281
Regeneration	34	0	0	0	0

1/ Values in parentheses ( ) are the percentage of acres with selection harvest prescriptions using 50 percent - 70 percent volume retention.

2/ Some acres of habitat are not mutually exclusive. For example, some riparian habitat is also considered beach fringe.

3/ These values represent the total acres of productive old growth (POG) (low, medium, high volstrata GIS data) within the units; therefore, they do not take into account that some POG is left in retention areas within the harvest units.

4/ Beach and estuary fringe represents an area approximately 1,000 feet of the coastal zone that is the transition between land and water.

5/ Riparian areas represent the zone of interaction between the aquatic and terrestrial ecosystems. The acreage is the area of Riparian Management Areas as defined by the stream channel process group direction in the Forest Plan.

6/ Some slide zone inclusions occur in the upper elevations of proposed helicopter harvest units. No harvest would actually occur within these inclusions.

7/ Wetland acres are from the National Wetland Inventory data (i.e., palustrine forested, palustrine scrub-shrub, and palustrine emergent).

### ***Environmental Effects***

No timber harvest would occur in the beach and estuary fringe under any of the alternatives based on the Forest Plan standards and guidelines. Alternatives 2, 3, and 4 would construct LTFs and sort yards at both Jenkins Cove and the mouth of Moose Creek. Alternative 5 would only construct the Jenkins Cove LTF. The maximum area cleared for construction of these facilities would be less than 10 acres of beach fringe land per site. This is less than 1 percent of the beach fringe occurring in the Project Area.



### **3 Affected Environment and Environmental Consequences**

#### ***Wetlands***

##### ***Affected Environment***

Wetland habitats are categorized by the USFWS classification system (Cowardin et al., 1979). Wetland systems are described in detail and acreage values are provided in the *Wetlands and TES Plants* Resource Report (Kershke and Arnett, 1999). The palustrine wetland system is divided into three classes: (1) forested, (2) scrub-shrub, and (3) emergent. In the Project Area, wetland classes are typically mixed. Large areas are classified as mixed emergent forested and mixed emergent scrub-shrub. Scrub-shrub and emergent wetlands typically have the greatest value as habitat for wetland-associated species. In Southeast Alaska, emergent wetlands that have a ground cover high in sphagnum mosses and/or sedges are called "muskegs" (USDA Forest Service, 1997a). These wetland types can contain a variety of plant communities, and the water table is at or near the surface and numerous small ponds are scattered throughout. Furbearers, certain waterfowl and numerous other wildlife species tend to concentrate in wetland habitats. The Project Area has approximately 7,872 acres of wetlands (Table 3-18).

##### ***Environmental Effects***

Due to the marginal nature of commercial timber within muskeg or other non-forested/scrub-shrub wetland habitats, these areas were generally avoided. Wildlife using these muskegs may be temporarily affected due to disturbance. Harvest activities would mainly impact forested wetland sites. The greatest wetland area within harvest units occurs under Alternatives 3 (424 acres) and 4 (419 acres) and the least occurs under Alternative 5 (281 acres) (Table 2-1). However, Alternatives 3 and 4 also have the highest proportion of selection harvest (50 to 70 percent retention) and harvest by helicopter which will have the least impact on wetlands.

The construction of roads would permanently remove wetland habitat. The largest impact would occur under Alternative 2 (6.5 miles/39.4 acres) and the least impact would occur under Alternative 4 (0.1 mile/0.6 acre). These acreage values are less than 1 percent of the existing wetland acreage in the Project Area. The wetlands affected by roads are primarily forested wetlands, as the roads are located to avoid high value wetlands. (See wetland section for a full discussion of wetlands and roads.)

#### ***Riparian Areas***

##### ***Affected Environment***

Riparian areas encompass the zone of interaction between the aquatic and terrestrial ecosystems, and include riparian streamsides, lakes, and floodplains with distinctive resource values and characteristics (USDA Forest Service, 1997b). Riparian areas often contain both hardwood (e.g., alder) and coniferous forest types and, therefore, generally support a relatively high diversity of wildlife species. Riparian areas also provide important linkages to other habitat areas within a watershed, and may act as travel corridors for certain wildlife.

Based on the TTRA of 1990, the Forest Plan riparian standards and guidelines state as a minimum, no commercial timber harvest is allowed within 100 feet horizontal distance either side of Class I and Class II streams which flow directly into a Class I stream (USDA Forest Service, 1997b). The standards and guidelines also establish that no programmed commercial timber harvest shall occur within the Riparian Management



Area (RMA). The Forest Plan prescribes specific slope distances for RMAs based on stream channel process groups. These variable width no-harvest buffers apply to Class I, II, and III streams. The acreage of riparian habitats is considered to be equal to the area of RMAs as delineated by the stream channel process group direction (USDA Forest Service, 1997b). Within the Project Area, high and medium volume old-growth forest are the predominant cover types in riparian areas.

### *Environmental Effects*

No timber harvest would occur within RMAs. Riparian habitat and function will be maintained because of these buffers. Some riparian habitat that occurs along Class IV streams may be harvested.

### *Old-Growth Forest*

#### *Affected Environment*

Old-growth forests are ecosystems distinguished by old and large trees and related structural attributes (USDA Forest Service, 1997a). Old growth encompasses the later stages of stand development, which typically differ from earlier stages in a variety of ways, including: larger tree sizes, more variation in size and spacing; large dead standing or fallen trees; broken or deformed tops, bole and root decay; multiple canopy layers; and canopy gaps and understory patchiness (USDA Forest Service, 1997a). These types of features are more likely to develop in forests that are more protected from large-scale catastrophic storm damage, and where gap-formation processes dominate the disturbance regime (Kramer et al. 2001). Gaps are small-scale disturbances created by the death of one or more trees and may continue to expand over time if additional trees die on the periphery. The direct and indirect effects of the canopy gap on forest dynamics such as regeneration and understory development extends beyond the perimeter of the canopy opening. The legacy of tree death may persist for more than 80 years before the gaps fill in due to lateral expansion of the surrounding forest canopy and growth of regeneration in the gap (Ott and Juday 2002).

In general, old-growth forests can be divided into productive and unproductive types, based on the ability of specific areas to grow trees of a certain size (USDA Forest Service, 1997a). POG is divided into three volume strata: high, medium, and low. A brief description of these classes, and their value as wildlife habitat, follows.

High Volume Strata Old-Growth Forest. These forests have an average timber volume of 35 MBF per acre (USDA Forest Service, 1997a). The average height of co-dominant trees is greater than 100 feet. Canopy closure is 65 to 95 percent, with western hemlock and/or Sitka spruce dominating most sites. Stands are typically uneven-aged, with small gaps in the overhead canopy. Understory production is moderate, but snow interception is high, making forage (for deer) more readily available during winter. *Vaccinium* is the dominant shrub; herb cover is 20 to 30 percent, and fern cover is 15 to 30 percent. The Project Area has approximately 8,575 acres of high volume old-growth forest (Table 3-19).

Coarse-structured (multi-aged, large trees), low elevation forest is important for several wildlife species including deer, goshawk, and forest songbirds. High volume forest (measured in these analyses) incorporates the majority, if not all, of the coarse-structured forest stands; however, other forest structure types (for example, even-aged stands) may also be classified as high volume. The Forest Service is currently verifying the accuracy

### 3 Affected Environment and Environmental Consequences

Table 3-19.

**Total Acres of Productive Old Growth (POG) in the Project Area and Acres Remaining After Harvest by Alternative<sup>1/</sup>**

Timber Volume (Volstrata)	Alternative								
	1	2		3		4		5	
	Project Area Acres	Acres	% change	Acres	% change	Acres	% change	Acres	% change
Low	3,386	3,626	7	3,694	9	3,796	12	3,556	5
Medium	7,418	7,367	(1)	7,336	(1)	7,368	(1)	7,502	1
High	8,575	7,495	(13)	7,864	(8)	7,827	(9)	7,818	(9)
Total POG	19,379	18,488	(5)	18,894	(3)	18,991	(2)	18,876	(3)

<sup>1/</sup> Results by alternative reflect the retention left within harvest units by determining post-harvest volume within each unit. Note that because of the high amount of retention in some prescriptions (e.g., uneven-aged management prescriptions), treated acres may remain as POG and may continue to be classed in the same volstratum or be converted to another volstratum, depending on the past harvest volume per acre. Values in parentheses ( ) represent a decrease.

of models for use in identifying coarse canopy stands. Until that assessment is complete, timber volume (TIMTYP) classes 6 and 7 are believed to be an adequate predictor of those stands (Caouette et al., 2000). Characteristics of these stands include relatively low stem densities, large diameters, and a canopy that appears coarse-textured when viewed from the air. There are currently a total of 1,716 acres of volume class 6 and 7 within the Project Area. Timber harvest is permitted in 839 of those acres of volume class 6 and 7 (Table 3-20).

**Medium Volume Strata Old-Growth Forest.** These forests have an average timber volume of 25 MBF per acre (USDA Forest Service, 1997a). The average height of co-dominant trees is 70 to 100 feet and canopy closure is 40 to 75 percent. Western hemlock and/or Sitka spruce are still the dominant species (but cedars and mountain hemlock can be significant components as well). The stands are uneven-aged, with numerous gaps in the overhead canopy. A more open canopy results in a more abundant understory, but it is subject to burial by snow in the winter. *Vaccinium* and forbs are more abundant in these forests, ferns are less common. Winter thermal cover for wildlife is moderate. The Project Area has approximately 7,418 acres of medium volume old-growth forest (Table 3-19).

**Low Volume Strata Old-Growth Forest.** These forests have an average timber volume of 16 MBF per acre (USDA Forest Service, 1997a). Tree height is typically less than 60 feet, and canopy closure is 20 to 50 percent. Western hemlock and cedars predominate. The understory is very brushy, dominated by tall thickets of *Vaccinium* and rusty menziesia (*Menziesia ferruginea*) which tend to diminish the production of ferns, herbs, and forbs. Lichens are relatively abundant. Thermal cover for wildlife is poor. The Project Area has approximately 3,386 acres of low volume old-growth forest (Table 3-19).



Table 3-20.

**Existing Acres of Coarse-canopy Productive Old-growth in the Project Area and Proposed Harvest of Coarse-canopy Forest by Alternative.**

Existing acres of "Coarse Canopy" (Volume classes 6 and 7)				Acres of "Coarse Canopy" in Proposed Harvest Units				
Total <sup>1/</sup>	Timber harvest not permitted		Timber harvest permitted	Alt1	Alt2	Alt3	Alt 4	Alt 5
	LUDs <sup>2/</sup>	S&Gs <sup>3/</sup>						
1,716	429	631	839	0	230	81	85	157

<sup>1/</sup> The sum of the acreage shown under LUDs, S&Gs, and areas where timber harvest is permitted exceeds this total because there is overlap between acreage counted in OGRs and areas protected from harvest by Forest Plan Standards and Guidelines.

<sup>2/</sup> Examples include small OGRs.

<sup>3/</sup> Examples include beach, estuary, riparian, and other wildlife buffers

### *Environmental Effects*

Table 3-19 shows the acres of high, medium, and low volume strata old-growth forest remaining after harvest under each alternative. The values under each alternative reflect the amount of retention left within each unit by determining the amount of post-harvest volume in each unit based on the prescription. For clearcuts, it is assumed that the total acreage is no longer POG after harvest. For patch cuts, it is assumed that 40 percent of the acreage is no longer POG after harvest. For the group selection and individual tree/group selection prescriptions, which retain 50 to 70 percent, the high volume was reduced to medium volume, medium volume was reduced to low volume, and low volume remained in the low volume category. These classifications were based on the average strata volumes and the percent removal in each unit. Under all alternatives, the net effect is to decrease the acreage in the high volume strata stands, increase the acreage in the low volume strata stands, and keep the medium volume strata acreage about the same.

Alternative 2 has the greatest effect on high volume forest with the loss of 1,080 acres (13 percent) and Alternative 5 would have the least effect with the loss of 757 acres (9 percent) (Table 3-19). Low volume strata stands are increased between 5 and 12 percent depending on the alternative.

Alternative 2 would affect the greatest number of acres of coarse canopy forest, followed by Alternative 5 (Table 3-20). Alternatives 3 and 4 would affect the least amount of coarse canopy acres of any of the action alternatives.

### *Other Habitats*

#### *Affected Environment*

Other wildlife habitats in the project area include alpine/subalpine areas (4,351 acres), ice/snow fields (332 acres), and recurrent slide zones (3,714 acres) (Table 3-18). Alpine/subalpine roughly corresponds to the zone near or above tree line (generally about 2,500 feet). This habitat type includes areas identified in the GIS database as low productivity forest due to high elevation as well as high-elevation non-forest types. This zone is important habitat for mountain goats, as well as important summer range for deer and bear and resting or brooding habitat for geese. Recurrent slide zones are important spring and summer habitats for both mountain goats and bear. Approximately 34 acres in one stand at the mouth of Moose Creek was harvested in the project area in the 1950s.



### 3 Affected Environment and Environmental Consequences

#### *Environmental Effects*

Some slide zone inclusions occur in the upper elevations of proposed helicopter harvest units in upper Moose Creek. The units that show small inclusions of slide zones have harvest prescriptions that call for avoiding slide areas as well as the adjacent areas. As a result, no harvest would actually occur within any known slide zone area.

Other habitats important to wildlife are not expected to be affected by the proposed project. No timber harvest would occur in these habitats (Table 3-18).

#### **Forest Fragmentation**

##### *Affected Environment*



Forest fragmentation is used to describe a process in which a forest block becomes subdivided into smaller more isolated units. Fragmentation has the potential to isolate small populations, contribute to decreased population distribution, and increased likelihood of local extinction. However, fragmentation should be viewed from the organism's perspective. If movement between populations is not altered, then fragmentation has not occurred.

The Tongass National Forest is characterized by fragmentation at many scales and is fragmented by different processes. On a small scale, single-tree gaps within a 400-year-old Sitka spruce stand provide habitat for forest interior birds such as the hairy woodpecker. The majority of these gaps are less than 1.3 acres (75 m<sup>2</sup>) in size (Ott and Juday 2002). This scale of disturbance predominates in areas most protected from wind disturbance (Kramer et al. 2001). On a broader scale, large patches of wind disturbance of 10 acres or more can create nesting habitat for songbirds such as the orange-crowned warbler. Stand replacement events tend to occur more frequently in forests more prone to catastrophic wind damage, such as those with more southerly aspects (Kramer et al. 2001). From a regional perspective, the Tongass National Forest is highly fragmented due to numerous islands and dramatic topographic relief. Across the Project Area, at a landscape level, the natural distribution of productive old-growth forest is quite patchy, being fragmented by muskegs and non-productive forested wetlands.

Impacts of fragmentation include isolation and edge effects. Patches of old-growth forest can be simplistically characterized as having two zones: a boundary zone between the forest and the adjacent habitat (referred to as "edge" forest habitat), and an interior zone that is not significantly influenced by adjacent habitat (referred to as "interior" forest habitat). Interior habitat retains moisture, temperature, and vegetation conditions that are unique to old-forest conditions. Old-growth dependent species typically thrive in interior forest habitat conditions, and tend to be sensitive to the influence of the encroachment of edge habitat (i.e., "edge effects"). The edge effect can extend 100 meters or more into the forest. When fragmentation occurs in a forested environment there is an increase in the amount of edge habitat and a decrease in the interior forest habitat, thereby making patches less suitable for old-growth dependent species.

Timber harvesting adds to the level of fragmentation or edge that is occurring naturally. The effect of clearcut harvest-level fragmentation varies with the placement of units and their proximity to large existing forest blocks. Simulation studies have indicated that when 50 percent of a watershed is harvested with a staggered setting design, little if any forest interior remains. Whether a particular patch pattern and degree of fragmentation is beneficial or deleterious largely depends on the characteristics of the species using the landscape (Morrison et al., 1992).

Within the Project Area, there are three main large blocks of old-growth forest: the area south and southeast of Virginia Lake, the area north and east of Madan Bay, and the Moose Creek drainage (Figure 3-16). The area southeast of Virginia Lake is mostly medium and high volume old growth, approximately two-thirds of which is included in the proposed Virginia Lake OGR. Also about two-thirds of the block north and east of Madan Bay is included in the proposed Madan Bay OGR. This block extends north towards the Jenkins Cove area where it becomes more naturally fragmented by muskegs (Figure 3-16).

The Moose Creek block extends approximately 3.5 miles up Moose Creek to the north and also extends to the southeast out of the Project Area towards Berg Bay.

### ***Environmental Effects***

For the Madan Timber Sale, the four harvest prescriptions described below would be implemented in some combination for each of the alternatives (Figures 3-16 through 3-19).

- Clearcut with minimum 10 percent retention—Up to 90 percent of the volume of the merchantable trees greater than 9 inches dbh will be harvested.
- Patch cut with minimum 60 percent retention—This prescription involves small clearcuts up to 5 acres in size, scattered throughout the unit. Approximately 30 percent of the volume of the unit will be targeted for harvest, but harvest may reach 40 percent.
- Group selection with minimum 70 percent retention—Harvest groups up to 2 acres in size, scattered throughout the unit. Approximately 25 percent of the volume of the unit will be targeted for harvest, but harvest may reach 30 percent.
- Individual/Group selection with minimum 70 percent retention—Harvest individual trees and/or small groups up to 2 acres in size, scattered throughout the unit. Approximately 25 percent of the unit will be targeted for harvest, but harvest may reach 30 percent. A variation of this prescription is used on three units under Alternative 4. Retention percentage is reduced to 50 percent in these units because they are largely not visual concerns.

Because of the high degree of natural fragmentation and the various selection harvest prescriptions that do not result in clearcut areas, but instead leave 50 to 70 percent retention, it is difficult to determine what constitutes edge or fragmentation in the Project Area. Across the Project Area, Alternative 2 would have the greatest effect on fragmentation of the landscape because harvesting would occur across a greater area in the Moose Creek and Virginia Lake drainages as well as in the Jenkins Cove area. Alternative 2 would also have the highest number of acres of created openings because, not only would more overall acres be affected, but a higher proportion of those acres would be in clearcuts greater than 5 acres in size (38 percent) (Table 3-21). Alternatives 3, 4, and 5, each include at least one block that is not harvested (i.e., no harvest occurs in the Virginia Lake area under Alternatives 3 and 4; no harvest occurs in the Moose Creek drainage under Alternative 5). Fewer clearcut openings are created with Alternative 4. Although more acres would be harvested in this alternative than for Alternatives 3 and 5, this alternative has the smallest proportion of acres in clearcuts greater than 5 acres (16 percent) (Table 3-21).



### 3 Affected Environment and Environmental Consequences

Table 3-21.

**Clearcut Harvest Area (acres) and Percentage of Total Treated Area to be Clearcut by Old-growth Block**

Old-growth Block	Alternative 2 <sup>1/</sup>		Alternative 3 <sup>1/</sup>		Alternative 4 <sup>1/</sup>		Alternative 5	
	Acres	%	Acres	%	Acres	%	Acres	%
Jenkins Cove	246	26	225	18	0	0	246	32
Virginia Lake	262	46	0	0	0	0	262	46
Moose Creek	283	47	157	35	283	47	0	0
<b>All Blocks</b>	<b>791</b>	<b>38</b>	<b>381</b>	<b>22</b>	<b>283</b>	<b>16</b>	<b>508</b>	<b>38</b>
<b>Total Treated Area</b>	<b>2,105</b>	<b>---</b>	<b>1,719</b>	<b>---</b>	<b>1,769</b>	<b>---</b>	<b>1,353</b>	<b>---</b>

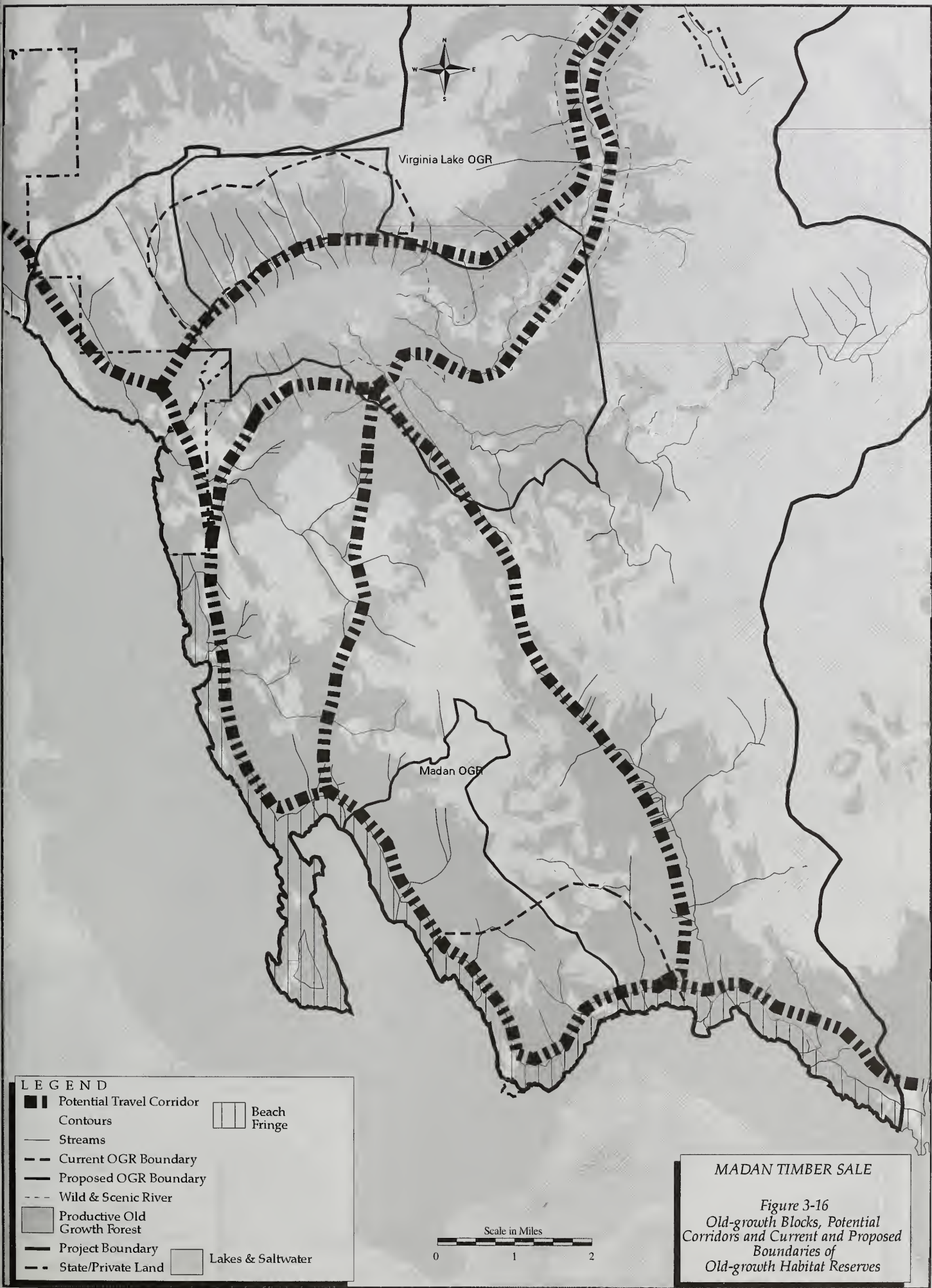
1/ Alternatives 2, 3, and 4 would also include approximately 106 acres of patch cut openings (2-5 acres each) in the Moose Creek block.

The block of old growth southeast of Virginia Lake would largely (approximately 75 percent) be protected under all alternatives due to the proposed Virginia Lake OGR. Alternatives 3 and 4 would not harvest in the Virginia Lake area and, therefore, would have no effect on this block of old growth. Alternatives 2 and 5 have the same level of harvest in this area and would add to the natural fragmentation of the 25 percent of this block not contained in the proposed OGR.

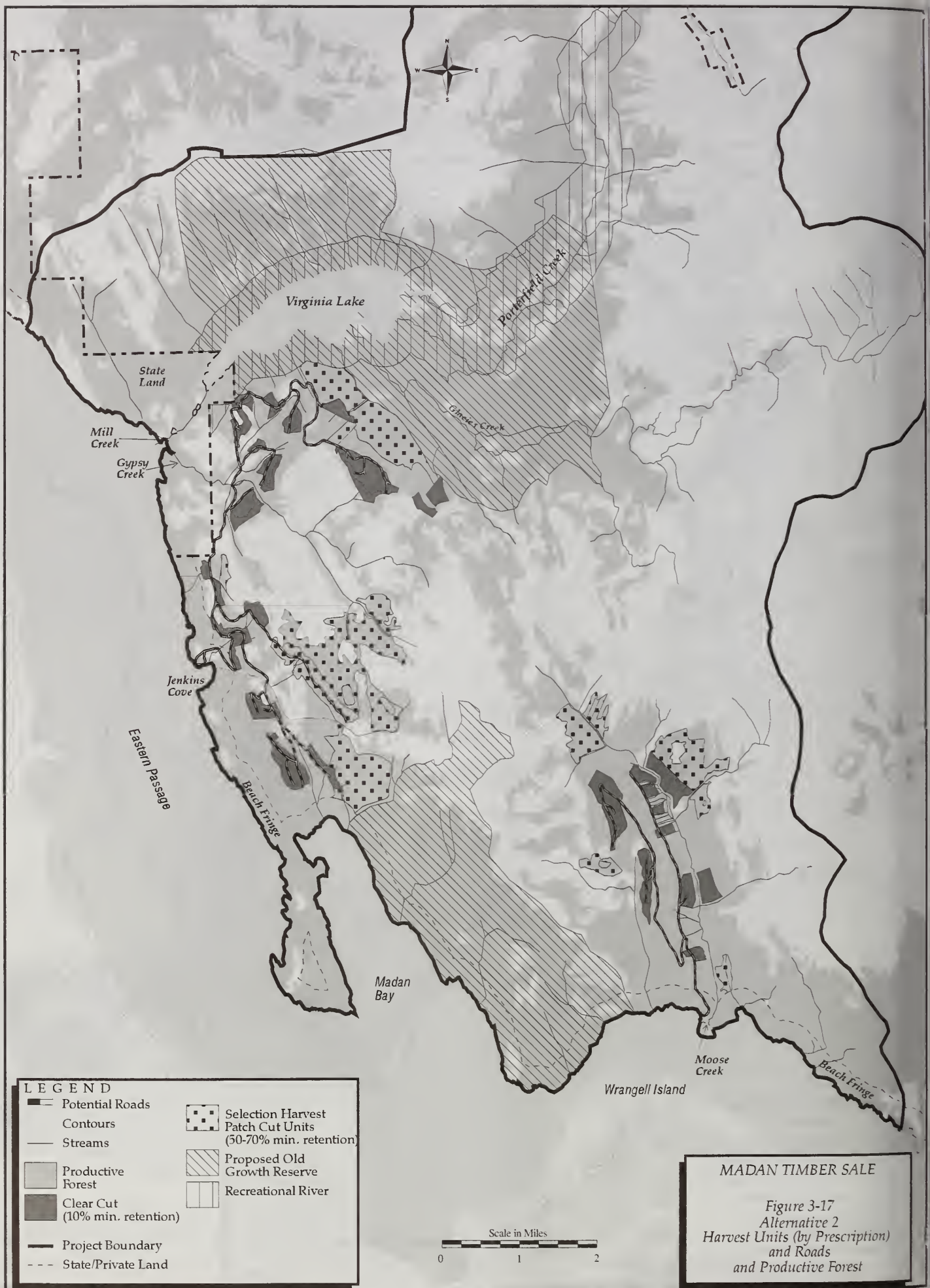
Northeast of Madan Bay would also largely (approximately 75 percent) be protected under all alternatives due to the proposed Madan OGR. Harvest would occur in the northern portion of this old-growth block under all alternatives. Alternatives 2 and 5 have the same level of harvest over a smaller area than Alternatives 3 and 4; however, Alternatives 3 and 4 have more units with prescriptions that have 50 to 70 percent minimum retention.

The block of old growth in Moose Creek would not be affected under Alternative 5. Approximately half of this block (the west side of Moose Creek) would not be affected under Alternative 3. Alternatives 2 and 4 would have the same level of harvest and would reduce the size of this old-growth block by 283 acres and reduce interior forest by an even greater amount.

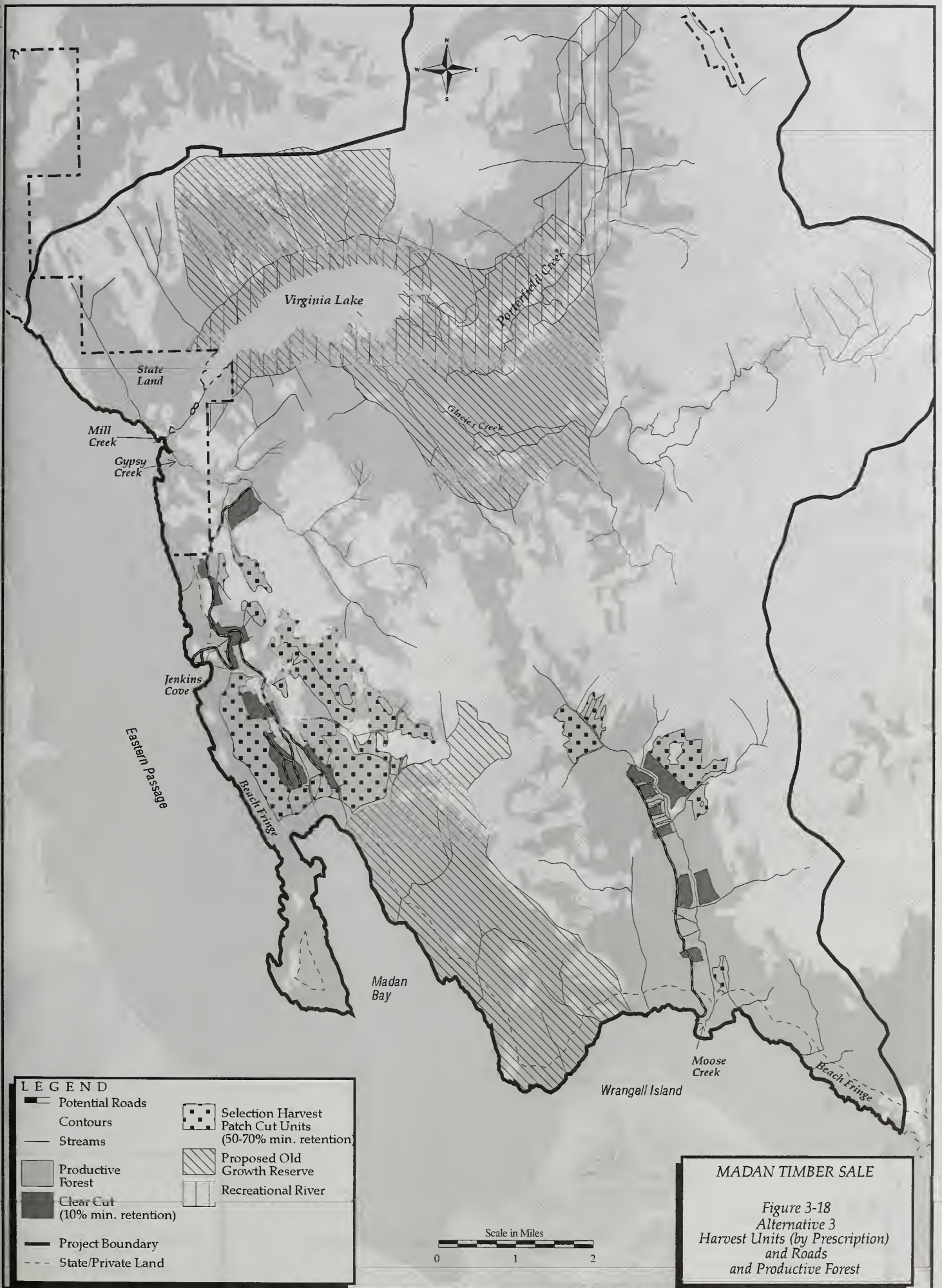




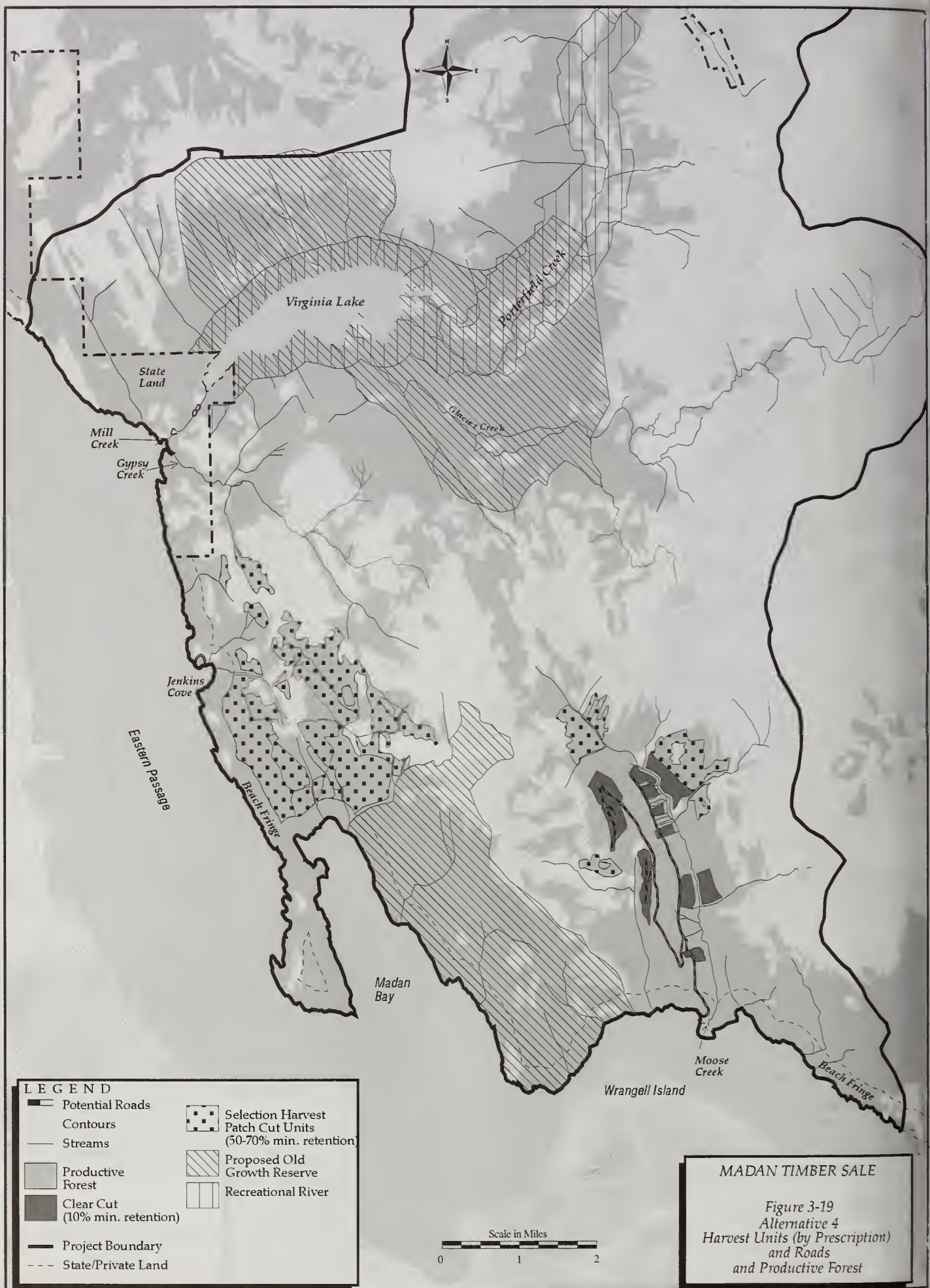




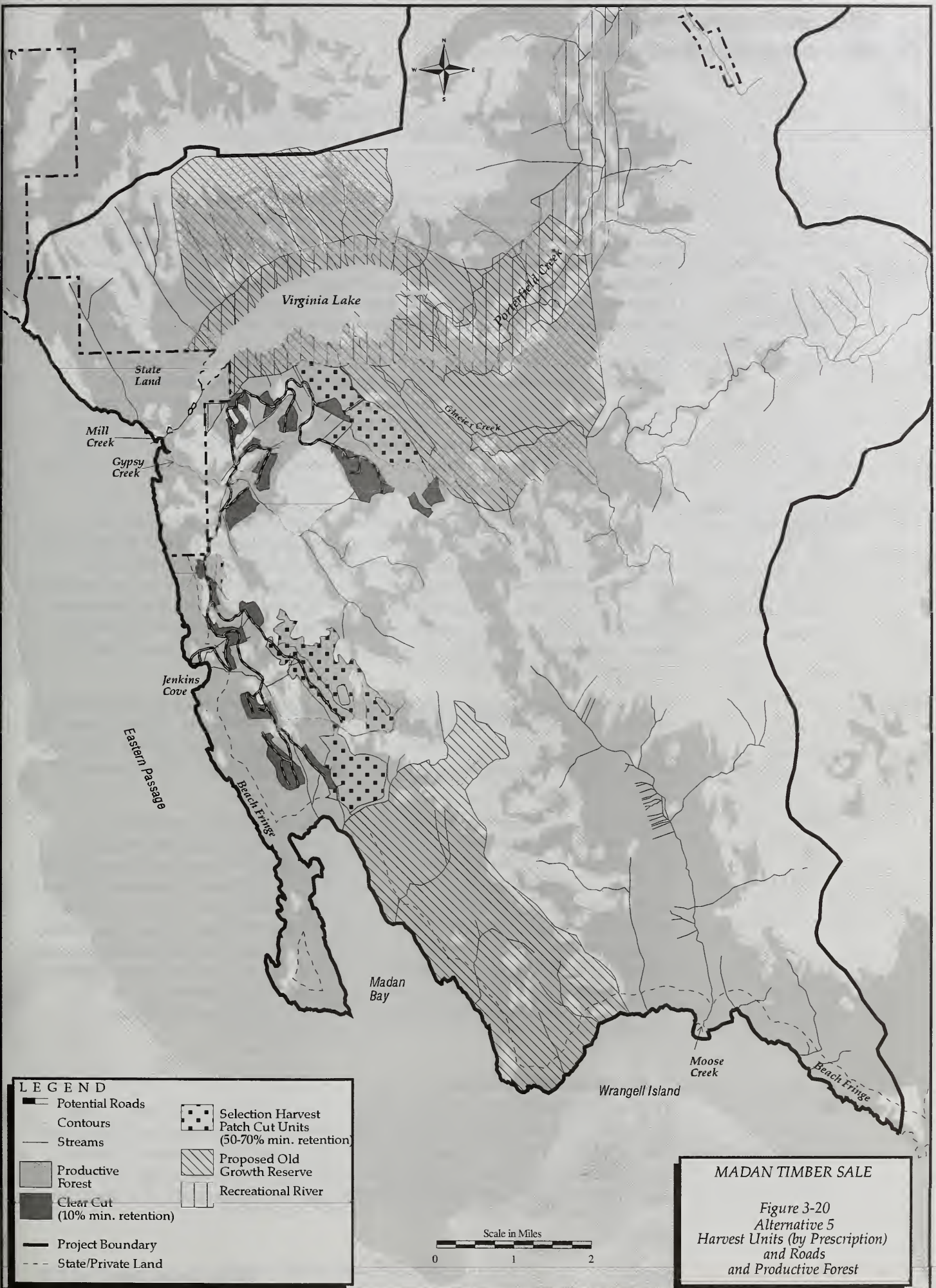












### **3 Affected Environment and Environmental Consequences**

#### **Wildlife Corridors**

##### ***Affected Environment***

Low elevation passes, beach fringe, and stream corridors provide natural connections between forested blocks and are important areas for migrating and dispersing wildlife. Corridors can be protected by not harvesting within them or by managing the matrix of habitat between the reserves (Suring et al., 1992a). Under the Forest Plan, maintaining forested corridors between small reserves is important for maintaining viable wildlife populations on the Tongass National Forest because a portion of the habitat matrix between the reserves is scheduled to be harvested (USDA Forest Service, 1997b).

In general, the beach fringe zone is believed to be an important wildlife travel corridor (Figure 3-16), providing low-elevation connectivity between watersheds that are separated by very steep sides and non-forested ridge-tops. Riparian areas are frequently important travel corridors within watersheds, while forested corridors along slopes are used for the seasonal movement of certain wildlife species between summer and winter range. Low-elevation passes are also used by wildlife for movement between watersheds (Figure 3-16).

Within the Project Area, the principal concern is maintaining an effective wildlife corridor connecting the Madan OGR to the south and the Virginia Lake OGR to the north of the Project Area (Figure 3-16). Currently, the beach fringe is an effective travel corridor for old-growth dependent species; however, possible future harvest on state lands near the mouth of Mill Creek could disrupt this connectivity and, thus, the effectiveness of the beach fringe as a travel corridor. The principal north-south stream corridors are Moose Creek and Porterfield Creek. A relatively low elevation pass connects these two stream corridors (Figure 3-16).

At the southern tip of the project area, between the mouth of Madan Bay and the mouth of Moose Creek is a 1,000-foot wide stretch of salt water, known as The Narrows, where the mainland lies closest to Wrangell Island. This area is potentially used as a travel corridor between the mainland and Wrangell Island. The Project Area side of The Narrows lies within the Madan OGR.

From a landscape perspective, the small OGRs in the Project Area provide some connectivity or linkages to other reserves or old-growth protection LUDs outside the Project Area. Approximately 2 miles north of the Porterfield Recreation River corridor is the Stikine-Leconte Wilderness (Figure 3-4). Also, a Semi-Remote Recreation LUD is located approximately 1.5 miles to the east of this Recreation River LUD. The Madan OGR is also approximately 2 miles from the Semi-Remote Recreation area to the east and is connected to this area by the beach fringe buffer. The larger mainland geographic area bounded by the Stikine River, Bradfield Canal and River, and the Canadian border has approximately 154,084 acres (70 percent of the area) of land designated as non-development LUDs, such as Wilderness, Semi-Remote, Recreation, and Remote Recreation.

##### ***Environmental Effects***

There is no direction to ensure connectivity among all small reserves or between small reserves and non-development LUDs including medium and large reserves (USDA Forest Service, 1998a). However, planning efforts should consider opportunities to maintain connectivity. In the future, if the state lands are harvested, the beach fringe corridor connecting the Madan and Virginia Lake OGRs may be compromised. All of the action



alternatives include harvest units near the state lands boundary; however, Alternative 4 would have only a slight effect on this corridor because it includes only two harvest units within 0.5 mile of the state lands, neither of which would be clearcut (Figure 3-16). In particular, Units J-49 and J-53 are not included in Alternative 4. Under Alternative 5, the low elevation pass corridor would remain fully intact because there would be no harvest in the Moose Creek drainage. In Alternatives 2, 3, and 4, Units M-156 and M-161, which are patch cuts with up to 5-acre openings and a minimum of 60 percent retention over the entire unit, may restrict this corridor at the upper reaches of Moose Creek because the area covered by productive forest is somewhat restricted in this area. Clearcut units further south along the drainage (i.e., M-117, M-119, and M-123) may reduce the quality of the corridor; however, the riparian corridor along Moose Creek and forested areas upslope of these units would be maintained. Alternatives 2 and 4 would have the greatest amount of harvest in the Moose Creek drainage; therefore, these alternatives may have the greatest effect on this corridor.

Connections to areas outside the Project Area would be maintained in the southern portion of the Project Area by beach fringe and the Madan OGR under all alternatives. However, the presence of the sort yard and LTF near the mouth of Moose Creek may limit wildlife use of the beach fringe as a travel corridor for several years during project implementation. In the northwestern portion of the Project Area, habitat connectivity to the area north of Virginia Lake may be affected due to timber harvest on state lands in the future although there are no harvest plans for the next 10 years. This potential future harvest on state lands would make the connection in the northeastern portion of the Project Area, along the Porterfield Creek Recreation River corridor, more crucial (Figure 3-16). None of the alternatives greatly influence the connectivity to outside the Project Area, although Alternative 5 with no harvest in the Moose Creek area would have no effect on the connectivity to the Semi-Remote Recreation area to the east.

### Old-Growth Habitat Reserves

A system of large, medium, and small old-growth habitat reserves has been identified and mapped in the Forest Plan as part of a forest-wide old-growth habitat conservation strategy. These reserves, in combination with other non-development LUDs, are to provide old-growth habitats to maintain viable populations of fish and wildlife species. The size, spacing, and habitat composition of these areas have been considered in addressing issues of large-scale fragmentation. Currently, there are two small reserves located in the Project Area: one north of Virginia Lake in VCU 502 (Virginia Lake OGR), and the other north of The Narrows along Madan Bay in VCU 504 (Madan OGR) (Figure 3-16). Forest Plan standards and guidelines state that the design of reserves (size, spacing, and habitat composition) should be evaluated at the project level. Small reserves require a contiguous landscape of at least 16 percent of the total VCU area; 50 percent of this area must be in POG (USDA Forest Service, 1997b). The Forest Plan also states that the acres found in LUDs that provide old-growth protection should be counted towards fulfilling the requirements of these standards and guidelines for small reserves (USDA Forest Service, 1997b).

From a landscape perspective, the existing reserve locations do provide some connectivity or linkages to other reserves or old-growth protection LUDs. The existing Virginia Lake OGR is located approximately 3 miles south of the Stikine-Leconte Wilderness Area. Although the Recreation River LUD that is adjacent to this small reserve does not connect with the Stikine-Leconte Wilderness, it does come within 2 miles of it. Also a Semi-Remote Recreation LUD is located approximately 1 mile to the east of this Recreation River LUD. The existing Virginia Lake OGR is less than 4 miles from another small

### 3 Affected Environment and Environmental Consequences

reserve that is located to the northwest, and approximately 6 miles north of the small Madan OGR in VCU 504. The existing Virginia Lake and the Madan small reserves are connected by the beach fringe buffer and the Recreation River LUD. The Madan OGR provides an important dispersal/movement corridor between the mainland and Wrangell Island through The Narrows, which is a saltwater channel approximately 0.25-mile wide. The Madan OGR is also approximately 1 mile from the Semi-Remote Recreation area to the east and is connected to this area by the beach fringe buffer. The proposed revisions to the small reserves will further enhance the connectivity between these reserves, especially over the low elevation pass between Moose and Glacier Creeks.

Along with the general criteria of size, POG, and connectivity, the design of each reserve should also be based on the wildlife concerns specific to the area. Criteria that are commonly used in designing small reserves include: important deer winter range, high probability goshawk nesting habitat, probable marbled murrelet nesting habitat, large forest blocks, rare plant associations, and landscape linkages (Iverson, 1996).

The Forest Plan (USDA Forest Service, 1997b) provides for further evaluation and possible adjustment of the location of small reserves. The Forest Service IDT biologist and biologists from ADF&G and the USFWS worked together to evaluate the location and composition of the existing small reserves as mapped in TLMP. Biologists from these three agencies and Foster Wheeler Environmental developed recommendations for new locations of the small reserves in the Project Area. Where feasible, the boundaries of the proposed small reserves follow geographic features so that the boundaries can be recognized in the field. The following is a discussion of the existing and the proposed small reserves.

#### ***Virginia Lake Old-Growth Reserve***

##### ***Existing Virginia Lake OGR***

Virginia Lake is in VCU 502, which is approximately 28,715 acres in size. Of this area, 10,710 acres are in POG. The existing Virginia Lake OGR is approximately 1,402 acres, of which approximately 915 acres is POG (Table 3-22, Figure 3-16). The adjacent Recreation River LUD has a total area of 2,603 acres, of which 1,992 acres are in POG. By combining these old-growth protection LUDs, this small reserve meets the criteria for acres of productive old growth; however, it does not meet the overall total size requirement. Note also that Recreation Rivers allow timber harvest if the adjacent LUD allows for timber harvest. This is the case for portions of the Recreation River LUD along Porterfield Creek; therefore, this area may not contribute to the old-growth strategy in the future if harvested. However, because most of the adjacent area is in Scenic Viewshed and roading opportunities appear limited, it is believed to be unlikely that any appreciable harvest would take place in this area. In order to meet the size requirement (16 percent of total area), the Virginia Lake reserve would need to add at least 3,192 acres.



Table 3-22.

**Total Size, Area of POG, and Suitable Lands for the Existing and Proposed Virginia Lake OGR (in acres)**

Virginia Lake OGR	Size (4,594 Acres Required)	POG (2,297 Acres Required)	Suitable Lands
Existing (TLMP) OGR <sup>1/</sup>	1,402	915	395
Proposed OGR	5,085	3,930	1,167 <sup>2/</sup>

<sup>1/</sup> These values do not include the acreages in the adjacent Recreation River LUD.

<sup>2/</sup> This value does not include potentially suitable land that was originally designated as Recreation River LUD (998 acres). Because most of the adjacent area is in Scenic Viewshed and roading opportunities appear limited, it is believed to be unlikely that any appreciable harvest would take place in this area.

The terrain in much of the current small reserve is very steep with roughly half the reserve in slopes of 50 percent or greater. However, the Recreation River portion of the small reserve is much lower in slope and includes substantial acreage of river bottom forest. The northern boundary of the OGR is high elevation, non-forest. The forested habitat is mapped mostly as low and medium volume strata. Currently, half the reserve is not suitable deer winter habitat based on the 1997 Tongass habitat conservation model (HCM) Deer Model. The Recreation River LUD in the area south of the reserve, along Virginia Lake, has large patches of medium value (HSI=0.5) deer winter habitat. This same area also consists almost entirely of high probability goshawk nesting habitat.

### ***Proposed Virginia Lake OGR***

The Madan project proposes, under all action alternatives, to change the boundaries of the existing Virginia Lake OGR in order to meet the size and POG requirements and enhance the utility and connectivity of this small reserve. The new small reserve encompasses much of the lower portions of the Porterfield and Glacier Creek watersheds, as well as the existing small reserve (Figure 3-16). The proposed small reserve provides a large variety of habitats for wildlife. This includes the lower reaches of Glacier and Porterfield Creeks; both are Class I fish streams and both are potentially important brown bear foraging streams. Also included are large areas of lower elevations, low relief riparian zones, a variety of timber types and strata, including higher volumes, as well as a variety of aspects and slopes. The proposed Virginia Lake OGR is concentrated below the 800-foot elevation which is optimal for most species of concern including deer and goshawk. Marbled murrelets were also observed flying up the Porterfield Creek drainage and along both sides of the eastern portion of Virginia Lake during 1998 field surveys (see the Marbled Murrelet section of this report). There are medium HSI deer winter habitat values in the Glacier Creek drainage, which is some of the best habitat in the northeastern portion of this VCU. This area is also likely to provide important winter habitat for mountain goats known to occur at the head of Glacier Creek and on Berg Mountain. This area also contains a wetland complex with unique wildlife habitat values. Extensive moose and beaver sign, as well as wolf sign, were observed throughout this area during 1997 field studies.

The proposed revision of the Virginia Lake OGR would have approximately 5,085 acres of which 3,930 acres would be POG, which exceeds both the Forest Plan recommendations for size and acres of POG (Table 3-22). Although this proposed small reserve includes 3,930 acres of POG, not all this timber is considered suitable for harvest. Based on GIS analysis, 1,765 acres of the proposed POG are considered not suitable for timber harvest mostly due to unstable soils, stream buffers, and floodplains. Another 998



### 3 Affected Environment and Environmental Consequences

acres are in the Recreation River LUD, which is considered a non-development LUD; therefore, the remaining 1,167 acres of suitable timber would be removed from timber production. Much of the area in this expansion is in the area surrounding Virginia Lake and Porterfield Creek. Due to the recreational use of Virginia Lake and the Virginia Lake Cabin, future timber harvest in this area would require significant mitigation to preserve scenic qualities as viewed from the lake and cabin.

In the future, road access through the Virginia Lake OGR may be necessary to reach Scenic Viewshed and Modified Landscape timber areas in the upper Porterfield drainage. Any road going through the proposed small reserve would pass through the relatively high-use recreation area of Virginia Lake. Such a road would likely need at least two major stream crossing, both requiring substantial bridges.

#### ***Madan Old-Growth Reserve***

##### ***Existing Madan OGR***

The Madan OGR is in VCU 504, which is approximately 16,782 acres. Of this acreage, 11,017 acres are in POG. The existing Madan OGR is approximately 1,791 acres of which approximately 1,443 acres are POG (Table 3-23, Figure 3-16). No other old-growth protection LUDs occur in this VCU. Although the existing small reserve meets the criteria for acres of POG it does not meet the overall total size requirement. In order to meet the size requirement (16 percent of total VCU area), 894 acres would need to be added.

Table 3-23.

**Total Size, Area of POG, and Suitable Lands for the Existing and Proposed Madan OGR**

	Size (2,685 Acres Required)	POG (1,343 Acres Required)	Suitable
Madan OGR			
Existing OGR	1,791	1,443	824
Proposed OGR	2,696	2,090	1,176

In the existing small reserve, the elevation ranges from sea level to approximately 2,000 feet. It consists of steep terrain including many cliff areas, but also contains areas with gentler slopes, especially along the beach fringe. Forest habitat is mostly low-medium volume, with a small patch of high volume on the eastern boundary along a cliff ridge. Much of the lower elevation band along the coast has high probability for goshawk nesting habitat. The deer winter habitat model shows small patches of high (0.8) HSI value habitat mostly along the saltwater in the beach fringe. Medium-high HSI values (0.5 to 0.7) habitat occur at lower elevations running north-south near the western boundary.

##### ***Proposed Madan OGR***

The Madan project proposes, under all action alternatives, to change the boundaries of the existing Madan OGR in order to meet the size requirement and enhance the utility of this small reserve. The proposed Madan OGR eliminates the eastern part of the existing small reserve and adds the area along the east shore of Madan Bay (Figure 3-16). This area includes south and west-facing slopes and the largest portion of the highest (0.6 to 0.8) deer winter habitat HSI values in the Project Area. Almost all the lower elevations of this small reserve are considered high probability goshawk nesting habitat. In 1999, an active goshawk nest was located in the proposed small reserve area by Forest Service biologists.

(See the Wildlife Resource Report: Griffin, 1999.) This proposed small reserve also maintains significant wildlife habitat on the mainland side of The Narrows to provide a possible dispersal/movement corridor between the mainland and Wrangell Island.

The proposed Madan OGR would be approximately 2,696 acres, of which 2,090 acres are POG, which meets both the Forest Plan recommendations for size and acres of POG. Based on GIS analysis, 914 acres of the 2,090 acres of POG are not suitable for timber production mostly due to beach fringe, unstable soils, and stream buffer requirements. Therefore, the remaining 1,176 acres of suitable timber would be removed from timber production.

## Management Indicator Species

MIS are species whose response to land management activities can be used to predict the likely response of other species with similar habitat requirements. All 13 of the MIS identified in the Forest Plan occur within the Project Area and have been discussed in the Wildlife Resource Report (Griffin, 1999). The hairy woodpecker (*Picoides villosus*), red-breasted sapsucker (*Sphyrapicus ruber*), brown creeper (*Certhia americana*), Vancouver Canada goose (*Branta canadensis fulva*), river otter (*Lutra canadensis*), and red squirrel (*Tamiasciurus hudsonicus*) are not discussed in detail in this document. Although the project is likely to affect some habitat of these species, the combined effects of the proposed OGRs, the proposed alternatives to clearcutting, and the Forest Service standards and guidelines are expected to provide adequate old-growth habitat for these species. These species are discussed in detail in the Wildlife Resource Report (Griffin, 1999).

The following seven MIS species are discussed below: bald eagle, black bear, brown bear, marten, Sitka black-tailed deer, mountain goat, and Alexander Archipelago wolf.

### Bald Eagle (*Haliaeetus leucocephalus*)

#### Affected Environment

The USFWS and Forest Service maintain an interagency agreement for bald eagle habitat management in the Alaska Region. A 330-foot radius protective management zone surrounds all identified nest trees. According to USFWS surveys, 19 bald eagle nest sites have been documented along the shoreline of the Project Area. Five of these nests were not found by USFWS biologists during the 1998 survey or during our surveys in 1997 and 1998. Two new active nests were discovered during 1998 field surveys. One nest is located at the tip of the Madan OGR along The Narrows, and another nest is located at the north end of Madan Bay, which could potentially be near the helicopter flight path in some alternatives. A nest located on the south side of Jenkins Cove may also be within helicopter flight paths in some alternatives. The nests thought to exist in the Moose Creek area either no longer exist or have not been active for the last 2 years according to field surveys in 1997 and 1998. Eagle nest locations and associated 0.25-mile timing buffers are displayed on the unit maps in Appendix B.





### **3 Affected Environment and Environmental Consequences**

#### ***Environmental Effects***

The Forest Plan standards and guidelines maintain buffers along shorelines, estuaries, and around all Class I and II streams. Also, the standards and guidelines maintain buffers around all known nest sites so if nests are located during project implementation these sites would be protected. All nests identified in the project area are within the no-harvest beach fringe; therefore, effects on the habitat of bald eagles would be minimized under all alternatives.

Disturbance to nesting bald eagles could occur from helicopter logging or transportation of crews and equipment by helicopter to various areas. If nests are found to be active, timing restrictions on flight paths may be necessary, especially in the Moose Creek, Jenkins Cove, and Madan Bay areas. Alternative 4, which includes all helicopter harvesting in the Jenkins Cove Block and has a barge drop in Madan Bay, could potentially disturb nesting eagles in the area. Also, any transportation of equipment or crews to the mouth of Moose Creek and Jenkins Cove could potentially disturb nesting eagles in the area. Helicopter activities for this timber sale would be restricted within 0.25 mile of active eagle nests (USDA Forest Service, 1997a). All Forest Plan standards and guidelines would be implemented to mitigate potential effects to bald eagles.

#### ***Black Bear (Ursus americanus)***

##### ***Affected Environment***

Black bears are present throughout the mainland and on the islands south of Frederick Sound (USDA Forest Service, 1997a). They use habitats from sea level to alpine. Estuarine, riparian, and forested coastal habitats receive the highest use by black bears and appear to have the highest habitat values (USDA Forest Service, 1997a). Within forested areas, both early and late- (old-growth) successional stages provide good forage and/or cover for black bears. Black bears prefer anadromous fish streams to resident fish streams (USDA Forest Service, 1997a). They are very mobile on land, and are not known to have specific vegetation corridor requirements (USDA Forest Service, 1997a).

Visual observations of black bear and their signs (tracks) were made throughout the Project Area in 1997 and 1998.

##### ***Environmental Effects***

Preferred habitats for black bear include coastal, estuarine, and riparian areas. The Forest Plan standards and guidelines maintain buffers with no programmed timber harvest along all of these areas.

Road densities within the Project Area would increase from 0 to between 0.2 and 0.6 mile per square mile (Table 3-24). Alternative 4 would have the least miles (6.7 miles) of road because no roads would be built in the Jenkins Cove area; this area would be logged by helicopter. Alternatives 2, 3, and 5 would all affect the Jenkins Cove area the most, both in miles of road and road density (Table 3-24). Under Alternative 4, the Moose Creek area would be affected the most. The Virginia Lake area would not be affected under Alternatives 3 and 4 and the Moose Creek area would not be affected under Alternative 5. Under Road Management Option A most roads would remain open after timber harvest and would allow limited use by high-clearance highway vehicles and full use by non-highway vehicles, mountain bikes, and hikers. This new road access into the area could



Table 3-24.

**Road Miles and Density for Groups of Watersheds that are Affected by Either Roads or Harvest by Alternative<sup>1/, 2/</sup>**

Watershed Groups <sup>3/</sup>	Alt. 1		Alt. 2		Alt. 3		Alt. 4		Alt. 5	
	Miles	Density	Miles	Density	Miles	Density	Miles	Density	Miles	Density
Jenkins Cove	0.0	0.0	8.3	1.3	5.8	0.9	0.2	<0.1	8.3	1.3
Virginia Lake	0.0	0.0	6.4	0.3	0.0	<0.1	0.0	0.0	6.4	0.3
Moose Creek	0.0	0.0	6.5	0.6	2.6	0.3	6.5	0.6	0.0	0.0
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>21.3</b>	<b>0.6</b>	<b>9.0</b>	<b>0.2</b>	<b>6.7</b>	<b>0.2</b>	<b>14.7</b>	<b>0.4</b>

<sup>1/</sup> This table represents only those watersheds in the project area that actually have roads or harvest activities within them. The sums of miles do not always equal the total miles due to rounding.

<sup>2/</sup> Under Road Management Option A roads would remain open and allow limited use by high-clearance vehicles. Road Management Option B would close roads to motorized vehicles; therefore, the open road density would drop to zero.

<sup>3/</sup> The watersheds that make up each Watershed Group are fully described in the Wildlife Resource Report (Griffin, 1999).

affect black bear populations by increasing hunter success. Under road management Option B, roads would be closed after timber harvest and would not allow use by motorized vehicles but would allow full use by mountain bikers and hikers. Although vehicle traffic would essentially be non-existent there could still be an increase in hunter success due to increased accessibility for walk-in hunters although any potential affect would be less than under Option A.

Based on habitat protection in OGRs and Forest Plan standards and guidelines buffers on beach fringe and streams, as well as alternatives to clearcutting and the implementation of the road access management strategy, the project is not expected to have significant effects on the black bear.

## ***Brown Bear (*Ursus arctos*)***

### ***Affected Environment***

Records indicate that the current and historical distributions of brown bear in Southeast Alaska are the same; some of the highest brown bear population densities in the world are found in the Tongass National Forest. Brown bear use sea level to alpine habitats and require large expanses of habitat and protection from human disturbances. The late summer season has been identified as the most critical or limiting period for brown bear (Schoen et al., 1989). During this season, bears concentrate along low-elevation valley bottoms and coastal salmon streams. These are the same areas of highest human use and most resource development activities. Although brown bear are known to occur in the Project Area (sightings and tracks observed during fieldwork in 1997 and 1998) the extent of use of the area is not known.

Current standards and guidelines for brown bear include the provision to evaluate the need for additional protection of brown bear habitat by potentially establishing additional forest buffers on important foraging areas (i.e., certain Class I anadromous fish streams) where a large amount of feeding on salmon occurs. There are three creeks in the Project Area that may fall into this category, Porterfield, Glacier, and Moose Creek. Both Porterfield Creek and the lower portion (i.e., 0.25 mile from Virginia Lake) of Glacier Creek are within the Recreation River LUD and both are within the proposed Virginia Lake OGR. Consultation with the Alaska Department of Fish and Game and the U.S.

### 3 Affected Environment and Environmental Consequences

Fish and Wildlife Service indicated that it is unnecessary to establish additional protection buffers on these streams.

Porterfield and Glacier Creeks are known to have coho, sockeye, and pink salmon, cutthroat trout, and Dolly Varden char. Fish-bearing waters in Porterfield Creek begin at the mouth of the creek at Virginia Lake and continue upstream approximately 11.5 miles. Anadromous species are blocked at approximately River Mile 3.3. This portion is a low gradient alluvial channel with the potential for heavy brown bear use. Glacier Creek has approximately 10.5 miles of fish-bearing waters; approximately 3.3 of these miles are anadromous waters. Also, approximately 2 miles upstream the stream changes from a high-gradient narrow channel to a low-gradient meandering channel that flows through a well-developed floodplain. This wide valley and floodplain area has the potential for good spawning habitat and thus, bear foraging activity. The brown bear population in ADF&G Game Management Unit 1B appears to be increasing; however, level of use of the Porterfield and Glacier Creeks area is unknown (personal communication, E. Crane, Area Wildlife Biologist, ADF&G, November 13, 1997).

Moose Creek is known to have coho, pink, and chum salmon, as well as trout species. There is a fish barrier approximately 0.8 mile upstream which limits all anadromous species (ADF&G, 1978), but the creek has approximately 3.3 miles of fish-bearing waters. Moose Creek has limited instream shelter and spawning habitat in the lower reaches and consists of a mostly moderate gradient narrow channel in the upper segments. The overall assessment of fish habitat value in the upper reaches (segments 2-4 miles) of Moose Creek is fair/poor (see the Fisheries and Watershed Resource Report). No fish were observed during field surveys. The lower 1,000 feet or more of Moose Creek is protected by the 1,000-foot beach fringe buffer. It appears that the stream above this lower 1,000-foot segment is not used by substantial numbers of anadromous fish and, therefore, does not have potential for important bear foraging activity.

#### *Environmental Effects*

The proposed Madan project is expected to have minor, if any, effects on brown bear habitat because this species uses a wide variety of habitats including clearcuts.

Potentially important brown bear foraging streams, Glacier and Porterfield Creeks, are within the proposed Virginia Lake OGR and would be fully protected. The most important reaches for anadromous fish in Moose Creek would be maintained within the 1,000-foot beach and estuary buffer. After consultation with ADF&G and USFWS, it was determined that no additional buffers would be needed to maintain brown bear foraging areas.

Roads and other human disturbances (i.e., facilities) may lead to an increase in bear-human encounters, which in turn may lead to bear population declines and reduced bear densities (see Black Bear Environmental Effects section). Miles of road would vary from 6.7 miles under Alternative 4 to 21.3 miles under Alternative 2 (Table 3-24). Roads may remain open under Road Management Option A, or closed under Option B (see Black Bear Environmental Effects section). Gated roads are less detrimental to bears than are roads open to vehicles, but still result in lower habitat quality due to the potential for increased bear-human interactions.

Based on habitat protection in OGRs and Forest Plan standards and guidelines buffers on beach fringe and streams, as well as alternatives to clearcutting and the implementation of the road access management strategy, the project is not expected to have significant effects on the brown bear.



## ***Marten (Martes americana)***

### ***Affected Environment***

Marten habitat use in western coniferous forests is related to canopy cover, availability of suitable resting and denning sites, and prey abundance (Buskirk et al., 1989). Optimal forest cover for marten in Southeast Alaska is generally considered to occur in older forests. This species is considered an indicator of low-elevation, old-growth forests (USDA Forest Service, 1997a). The quantity and quality of winter habitat is the most limiting factor for marten in Southeast Alaska. Open roads through marten habitat increase opportunities for trappers to harvest this species. High marten populations are usually associated with areas having restricted human access, such as roadless areas, or where trapping pressure is strictly regulated. Martens are easily trapped, thus, their populations decline more drastically when road densities approach 0.6 mile per square mile (Suring et al., 1992b). Although currently there are no roads in the project area, trapping does occur, mostly along the shoreline. Trapping pressure is considered to be low (see Subsistence Resource Report).

Marten habitat is considered to be high volume forest below 1,500 feet in elevation. Currently, in the Project Area there are approximately 7,509 acres of high probability marten habitat.

Marten are expected to occur throughout the lower elevations of the Project Area. A den was found during field surveys in 1998 in the Virginia Lake area.

### ***Environmental Effects***

The Forest Plan has specific protective standards and guidelines for marten habitat in high-risk biogeographic provinces. The Madan project does not fall into one of these provinces and does not have significant past harvest; therefore, the Project Area does not have specific standards and guidelines for maintaining marten habitat. Table 3-25 shows the acreage of high volume forest below 1,500 feet in elevation in the Project Area and the amount removed by harvest under each alternative. The values for each alternative reflect the retention left within harvest units by determining the post-harvest volume within each unit based on the prescription. For example, a unit with high volume forest with a prescription that has 70 percent retention is reduced to a medium volume stand after harvest. Therefore, any harvesting in high volume strata stands reduces the habitat value below the threshold of what is considered marten habitat. In general, under all selection harvest prescriptions, medium volume strata stands were reduced to low volume and low volume strata stands remained in the low category. The greatest decrease would be under Alternative 2, which would have approximately a 13 percent decrease (980 acres). The smallest decrease would be under Alternative 5, which would have a 9 percent decrease (662 acres) (Table 3-25).



### 3 Affected Environment and Environmental Consequences

Table 3-25.

**Total Acres in the Project Area and Acres Harvested of High Probability Habitat for Species of Concern by Alternative<sup>1/</sup>**

Species (High Probability Habitat)	Alternative									
	1		2		3		4		5	
	Acres	% Change	Acres	% Change	Acres	% Change	Acres	% Change	Acres	% Change
<b>Marten</b> (High volume and <1,500 ft elevation)	7,509	0	980	(13)	735	(10)	718	(10)	662	(9)
<b>Goshawk</b> (High volume and <1,000 ft elevation and slopes <60%)	5,402	0	542	(10)	474	(9)	409	(8)	424	(8)
<b>Marbled Murrelet</b> (Medium and high volume forest)	15,992	0	1,131	(7)	793	(5)	798	(5)	673	(4)

<sup>1/</sup> The values for acres of habitat removed under each alternative reflect the retention left within harvest units by determining post-harvest volume within each unit based on the prescription.

Values in parentheses ( ) represent a decrease.

Marten are easily trapped and are prone to overharvest, especially when trapping pressure is high. An increase in road density, particularly when located through marten travel corridors and foraging areas, would increase human access and the risk of trapping mortality. The access management plan is designed to reduce exposure of wildlife populations to increased hunting and trapping resulting from increased road densities. Table 3-24 shows future road miles and densities, however, road densities would drop to zero under the Road Management Plan Option B where roads are closed. Although closed roads are less detrimental to wildlife there would still be increased access to walk-in hunters and trappers.

#### ***Sitka Black-tailed Deer (*Odocoileus hemionus stikensis*)***

##### ***Affected Environment***

Sitka black-tailed deer are indigenous to coastal regions of Southeast Alaska and British Columbia and are a major recreation and subsistence species in these areas. Sitka black-tailed deer use all habitat types within the Project Area; signs of deer activity (i.e., pellets, browse, and tracks) were observed in almost all of the units visited in 1997 and 1998. However, during the winter this species uses lower elevation old-growth forests almost exclusively, especially when snowfall accumulations are high (Suring et al., 1992c).

Winter is the most limiting season for Sitka black-tailed deer (Hanley and McKendrick, 1985, cited in Suring et al., 1992c). The capability of winter habitat to support Sitka black-tailed deer is a function of forage abundance and quality (Hanley et al., 1989), snow interception qualities of the overstory (Hanley and Rose, 1987; Kirchhoff and Schoen, 1987), and climate as influenced by aspect, elevation, and maritime conditions (Hanley and Rose, 1987). Deer populations also respond to predation pressure and hunting mortality. Predation by gray wolves in particular is thought to significantly retard the recovery of the deer herd from mortality resulting from deep-snow winters (Smith et al., 1986).

Severity of the winter is a key factor in determining the capability of the land to support deer populations. The combination of deep-snow winters and large amounts of cleared winter range adversely affects deer populations. Even in unlogged conditions, a

deep-snow winter can result in relatively high deer mortality. Cleared areas and second growth greatly exacerbate the impacts of deep-snow winters by providing little snow interception, thus burying the understory forage.

Optimum winter deer habitat during deep-snow conditions includes low-elevation, high-volume old growth situated on well-drained sites that are characterized by large, irregularly spaced trees and an understory of abundant bunchberry (*Cornus canadensis*), five-leaf bramble (*Rubus pedatus*), and *Vaccinium* species. (Kessler, 1982; Hanley et al., 1989). Although deer in Southeast Alaska are generally considered an old-growth dependent species (Suring et al., 1992c; Kessler, 1982), this species forages extensively in young growth, particularly during mild winters (DellaSala et al., 1993), spring, and summer (Kessler, 1982). During the first 10 years after clearing, second-growth forests show a dramatic increase in the production of plants that are the primary food of deer in the winter (Suring et al., 1992c). After approximately 25 years, created openings begin forming a dense, closed-canopy young forest resulting in a rapid reduction of nutritious understory forage for deer, thus, habitat quality declines. An understory begins to develop again as stands reach 120 to 160 years of age (Suring et al., 1991a). The value of these areas as deer habitat continues to increase as the forest matures into old-growth forest.

## *Habitat Capability*

The 1997 revision of the deer habitat capability model (HCM) was used to evaluate the potential quality of winter habitat for Sitka black-tailed deer. The model incorporates the following factors in the analysis: (1) snow conditions, (2) presence of predators, (3) physiographic features including aspect and elevation, and (4) vegetation characteristics including: volume strata of old growth, second growth (25 to 150 years), and clearcut (0 to 25 years). Clearcuts receive low scores in high snow areas such as the mainland, but group selection and individual tree selection units provide moderate habitat conditions for deer.

An analysis of deer winter range resulted in HSI values ranging from 0 to 0.80. HSI values were limited to this range because of the interaction of predation and winter severity as determined by the HCM. HSI scores were then grouped into four categories of winter range quality: high (HSI more than 0.6), medium (HSI between 0.3 to 0.6), low (HSI between 0 and 0.3), and unsuitable (HSI = 0). These winter range quality categories, which are based on area-specific model results, are a way to rank habitat quality in a relative sense and were defined for this Project Area only. Based on this ranking system, the project area was evaluated for deer winter range quality. Under existing conditions, approximately 1,395 acres (3.3 percent) of high-quality and 4,381 acres (10.2 percent) of mid-quality winter range exist in the project area. In contrast, there are approximately 14,041 acres (32.8 percent) of low-quality winter range and 22,986 acres (53.7 percent) of unsuitable habitat in the Project Area (Figure 3-21).

The HCM was field verified using the Quick-Cruise Method for Assessing Deer Winter Range in Southeast Alaska (Kirchhoff and Hanley, 1992). The Wildlife Resource Report provides details of the methods and the results (Griffin, 1999). A linear regression statistical model suggests there is a significant relationship between the model values and the field data, although the relationship is very weak ( $P < 0.05$ ,  $r^2 = 0.03$ ). All completed data forms are located in the project files.

Based on the model and field observations, the largest block of high quality deer winter habitat occurs along the eastern side of Madan Bay (in the proposed Madan OGR) and northward to the head of the bay (Figure 3-21). Scattered small, high quality patches occur in the lower elevations from Madan Bay north to Virginia Lake. The Moose Creek



### 3 Affected Environment and Environmental Consequences

corridor has medium quality habitat. The north, east, and southeast sides of Virginia Lake also have blocks of medium quality winter habitat. Most of these blocks occur within the proposed Virginia Lake OGR.

Current deer habitat capability for the Project Area was calculated by multiplying the acreage of low-, medium-, and high-value deer winter range by a maximum long-term carrying capacity of 100 deer per square mile. The result is not an actual population number but a theoretical long-term carrying capacity for the habitat in the area given normal winter conditions. The number is useful for purposes of comparison. The current estimated deer habitat capability for the Project Area is 720 deer or 10.8 deer per square mile.

Sitka black-tailed deer is by far the most important, and most "harvested" terrestrial wildlife species for subsistence purposes and for sport hunting (USDA Forest Service, 1997b). For planning purposes, biologists estimate that 10 percent of a deer population can be harvested at carrying capacity with the population remaining stable and hunter satisfaction remaining high (Suring et al., 1992c). Harvest data are collected by the ADF&G and are summarized by WAA. The Project Area falls into parts of WAA 1810 and 1811. There currently is no ADF&G documented deer harvest from the Project Area, although a low level of subsistence hunting does occur (see the Subsistence Resource Report). Therefore, in terms of ADF&G documented harvest and interview information, the Project Area is considered a low use area for subsistence hunting (Galginaitis and Downs, 1999).

#### *Environmental Effects*

Under all action alternatives most of the highest value deer winter habitat would be protected within the proposed Madan Old-Growth Reserve and beach fringe. The primary effect on deer under each of the action alternatives would be a reduction in the quality of deer winter range within the project area. Table 3-26 shows the acres of high value deer winter range (HSI values greater than 0.6) remaining post-harvest. Alternatives 2 and 5 would remove the least amount (132 acres) of high value deer winter habitat. This is a reduction of 9.5 percent. Alternatives 3 and 4 would reduce the amount of high value winter range habitat by 252 acres (18.1 percent) and 232 acres (16.6 percent), respectively. These values reflect the fact that, outside of the proposed OGRs, the best high value winter habitat occurs at low elevations mostly in the Jenkins Cove area. Although Alternatives 3 and 4 both use prescriptions with high retention post-harvest (e.g., 70 percent), the units are located in some of the higher value habitat.

After 25 years, there would be no further reduction in the amount of high value deer winter range, because all harvest in areas of high value habitat would result in immediate conversion of the habitat to lower value.

Table 3-26.  
**Acres of High Value Deer Winter Range (HSI > 0.6) Currently in the Project Area and Post-harvest by Alternative**

	Alternative				
	1	2	3	4	5
Acres remaining post-harvest <sup>1/</sup>	1,395	1,263	1,143	1,163	1,263
Percent decrease	0	9.5	18.1	16.6	9.5

1/ Note that all prescriptions result in the conversion of high value winter range to lower value winter range. This is the reason why the percent decrease in high value winter range is larger than the percent decrease in habitat capability (compare with Table 3-27).





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Declines in deer habitat capability as a result of the proposed project would reduce deer habitat capability between 3.8 percent (Alternative 4) and 5.0 percent (Alternative 2) compared to existing conditions (Table 3-27). After approximately 25 years, created openings begin forming a dense, closed-canopy young forest with limited forage for deer; therefore, deer habitat capability would show a further decline of 0 to 2 percent compared to values immediately post-project (Table 3-27).

Additional analysis was done to produce greater accuracy in the deer model results. Post-harvest HSI values for selective harvest units were analyzed giving consideration to the volume stratum of the unit after harvest. Clearcuts were assumed to remove all volume over the entire unit. Patch cut HSI scores were modeled to reflect clearcut values for the 40 percent of the unit that is harvested and the original HSI value in the remaining 60 percent of the unit. Under group and individual tree/group selection prescriptions, high volume strata was reduced to medium, medium volume strata was reduced to low, and low retained the low volume category. This is based on expected volumes in each unit after harvest.

**Table 3-27.**  
**Habitat Capability for Sitka Black-Tailed Deer Immediately after and 25 Years after the Project<sup>1/</sup>**

Immediately after Project					
	Alternative				
	1	2	3	4	5
Number of Deer	720	684	688	693	693
Percent decrease	0.0	5.0	4.5	3.8	3.7
Deer per square mile	10.8	10.2	10.3	10.4	10.4
25 Years after Project					
	Alternative				
	1	2	3	4	5
Number of Deer	720	674	682	693	683
Percent decrease	0.0	6.4	5.3	3.8	5.1
Deer per square mile	10.8	10.1	10.2	10.4	10.2

<sup>1/</sup> Results reflect the retention left within harvest units as follows:

- For clearcuts, the entire unit was converted to an early successional stand;
- For patch cuts, 40 percent of the unit was treated as a clearcut;
- For selective harvest units, high volstrata were converted to medium, medium were converted to low, and low were maintained as low.

In addition, all harvest areas were modeled as if they were clearcuts in Alternatives 2 and 4. The purpose of this exercise was to examine the sensitivity of the assumptions we made regarding post-harvest habitat capability and develop a "worst-case" estimate. Assuming that all units in Alternatives 2 and 4 are clearcut, the resultant estimated habitat capability immediately after harvest would be 677 (versus 684) for Alternative 2 and 679 (versus 693) for Alternative 4. This exercise shows that, if one assumes all harvest prescriptions have the same effect on deer habitat capability as clearcutting, the resultant habitat capabilities would decline by an additional 1 to 2 percent.

Some increased deer harvest is expected to occur from increased hunter access to high elevation habitats via the roads that would be constructed (see Subsistence section). Although no specific recommendations exist for Southeast Alaska, black-tailed deer models developed in Washington indicate that road densities should be maintained below



2.5 miles per square mile to maintain habitat capability (Washington Department of Wildlife, 1987). Road densities after the project would be 0.6 mile per square mile or less for any of the alternatives (Table 3-24). Under Road Management Option A, the roads would be open which may increase hunter success due to accessibility. Road Management Option B would close the roads to motorized traffic.

### ***Mountain Goat (*Oreamnos americanus*)***

#### ***Affected Environment***

Mountain goats represent species that use cliffs, alpine and subalpine, and old-growth forest habitats. The quantity and quality of winter habitat is the most limiting factor for mountain goats in Southeast Alaska (USDA Forest Service, 1997a). Old-growth trees have the highest value because they intercept snow and provide understory forage plants. Behavioral strategies of mountain goats to avoid predators, particularly wolves, also affect habitat use by mountain goats. The need for escape terrain in close proximity is a critical factor in describing habitat for mountain goats. Mountain goats move into steep and broken terrain when approached by wolves. Mountain goats are known to occur on Berg Mountain and associated ridges, east of the project area, and at the head of Porterfield and Glacier Creeks. No known kidding areas occur within the Project Area.

Populations of mountain goats are very sensitive to human disturbance, especially those populations that are hunted. As human access increases into suitable mountain goat habitat, goats are less likely to use the habitat (Chadwhich, 1973; McFetridge, 1977, as cited in Suring et al., 1988).

#### ***Environmental Effects***

The project is not expected to have significant effects on mountain goat winter habitat. The areas with the greatest potential for winter habitat, the forested ridges along the upper reaches of Glacier and Porterfield Creeks, are within the proposed Virginia Lake OGR. No proposed timber harvest occurs near these areas. Timber harvest in the area east of the upper reaches of Moose Creek could potentially have a minor effect on goat winter habitat; however, the units in this area (M-127 and M-128) both have silvicultural prescriptions (patch cuts by helicopter) that would minimize potential effects on goat habitat.

The greatest potential impact to mountain goats is from increased access to hunters. Alternatives 2, 3, and 4 could theoretically increase accessibility to Berg Mountain; however, the likelihood that the roads, whether open or closed, would significantly increase access to mountain goats is extremely small. This is because the area between the proposed roads and Berg Mountain is extremely rough with slopes over 100 percent and with many cliffs. The easier access route from Berg Bay up a gentler ridge would likely remain the most commonly used route regardless of whether roads are built in Moose Creek and regardless of how the roads are managed. Effects on mountain goats under all alternatives are expected to be negligible.



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#### *Alexander Archipelago Wolf (*Canis lupus ligoni*)*

##### *Affected Environment*



Two Alaskan subspecies of the gray wolf are currently recognized. The wolf found in Southeast Alaska is known as the Alexander Archipelago wolf. It inhabits the mainland and the islands south of Frederick Sound. The total population is estimated at fewer than one thousand individuals in all of Southeast Alaska, with approximately 200 being harvested annually (Kirchhoff, 1991). Although wolves are listed as threatened in the contiguous 48 states, they are not listed in Alaska. They are a species of concern and a MIS on the Tongass National Forest. The commitment of the Forest Service to revise the Forest Plan to adequately protect habitat for the Queen Charlotte goshawk and other species associated with old-growth forest was an important element in the USFWS decision not to list the wolf in Alaska.

Two viability concerns for the wolf were addressed in the Forest Plan: (1) short-term increases in harvest, and (2) long-term, large reductions in deer habitat capability (USDA Forest Service, 1997b). Roads increase the risk to wolf population viability due to the high level of hunting, trapping, and poaching that can occur along roads. Pletscher (1994) recommends a road density threshold for wolves of no more than 1 mile of open road per square mile. According to the Forest Plan, open road densities of 0.7 mile per square mile or less are to be maintained. Currently, there are no roads in the Project Area.

As with deer, wolf harvest data are collected by the ADF&G and are summarized by WAA. Harvest data suggest that few wolves are harvested annually from WAAs 1810 and 1811, which encompass the Project Area. In fact, for the period from 1992 through 2002, the average annual wolf harvest for WAAs 1810 and 1811 was 0.6 wolf/year (6 total) and 0.3 wolf/year (3 total), respectively. All but one of these wolves was harvested by trapping (ADFG database). An interagency group of wildlife biologists (Forest Service, USFWS, and ADF&G) discussed existing wolf mortality with respect to the Madan project. They determined that there were no concerns about excessive mortality under existing conditions. However, all agreed that the risk of mortality would be increased with the development of road systems associated with this project, due to increased human access.

Wolves in Southeast Alaska prey on Sitka black-tailed deer, moose, mountain goat, beaver, black bear, spawning salmon, and geese. Deer habitat capability is believed to be a significant factor affecting the viability of wolf populations. Current deer habitat capability in the Project Area is estimated to be approximately 10.8 deer per square mile (see discussion of Sitka black-tailed deer).

According to the Wolf Standards and Guidelines Implementation Policy Clarification (USDA Forest Service, 1998a) to meet both sustainable wolf populations and human deer harvest demands, a habitat capability of 17 deer per square mile is recommended (The 2000 Tongass Monitoring and Evaluation Report recommends 18 deer per square mile). Note that these values should be used to make relative comparisons between alternatives, not as actual population estimations. Although the current deer habitat capability is less than the recommended level to sustain a viable population of wolves it is the natural habitat capability of the area. The 17 deer per square mile recommendation was derived for island populations: deer densities on the mainland are considered to be much lower due to winter conditions. Also on the mainland, the wolf prey base is augmented by the presence of other ungulates, such as mountain goats and moose, as well as beaver and salmon (personal communication G. DeGayner, USDA Forest Service, wildlife biologist, Petersburg, AK, March 23, 1998). Therefore, the deer habitat capability needed to

sustain viable wolf populations and deer hunting is expected to be lower than the recommended 17 deer per square mile, where hunting pressure is light.

Wolf sign (scat and tracks) was found during wildlife surveys in 1997 and 1998 in the Virginia Lake OGR near Glacier Creek and along Moose Creek.

### ***Environmental Effects***

The effect of the Madan project on the wolf population is displayed by analyzing the impact on the deer population and the level of roading by alternative. After 25 years, deer habitat capability would range from a low of approximately 10.1 deer per square mile under Alternative 2 to a high of approximately 10.4 under Alternative 4 (see discussion of Sitka black-tailed deer). Currently, hunting access is mostly restricted to the shoreline, but hunting of wolves is expected to increase with the increase in accessibility. Road closures would aid in mitigating interagency concerns about the potential for increased wolf mortality associated with the development of road systems in the project area. Road closures under Road Management Option B would reduce the potential wolf harvest; however, even closed roads provide walking corridors that would be used by hunters. Alternative 2 would have more miles (21.3 miles) of road and the highest road density (0.6 mile per square mile for the Project Area) than the other alternatives (Table 3-24). The road density in Wildlife Analysis Areas (WAAs) 1810 and 1811 would range from 0.0 to 0.1 mile per square mile for all alternatives; thus, remaining far below the 0.7 mile per square mile of open roads recommended for the protection of wolves. Although the project is not expected to have significant effects on prey species, in particular, Sitka black-tailed deer, wolves may be affected by the increase in access for hunters. Based on potential impacts on deer populations and the levels of roading, Alternative 2 would have the greatest effect on wolves, followed by Alternatives 5, 3, and 4, in that order.

### **Forest Service Sensitive Species**

Forest Service Region 10 Sensitive Species are those species that are identified by the Regional Forester for which population viability is a concern on National Forest System lands within a region. A viability concern is evidenced by either a significant current or predicted downward trend in the population or in habitat capability that would reduce a species' existing distribution. It is Forest Service policy to identify and manage sensitive species and their habitats to prevent the species from becoming listed as threatened or endangered (USDA Forest Service, 1997b).

#### ***Wildlife***

Four sensitive wildlife species are suspected or known to occur within the Project Area. Two of these species, the trumpeter swan (*Cygnus buccinator*) and the osprey (*Pandion haliaetus*) have standards and guidelines in the Forest Plan that provide protection of nest sites and significant wetland habitats, if found; therefore, these species will not be addressed in this document. More detailed discussion can be found in the Wildlife Resource Report (Griffin, 1999).

One species, the Peale's peregrine falcon (*Falco peregrinus peali*) is extremely difficult to distinguish from the American peregrine falcon (*F. p. anatum*) which was recently delisted as an endangered or threatened species (50 CFR Part 17, August 25, 1999). Because of the similarity of appearance, both species are discussed here. Peregrine falcon nest sites are closely associated with large seabird colonies on high cliffs. The American peregrine falcon potentially passes through the region on spring and fall migration flights;



### 3 Affected Environment and Environmental Consequences

however, neither species is known to nest or forage in the Project Area. Peregrine falcons are not expected to be affected by the project.

The Queen Charlotte goshawk is discussed below because this species is known to nest within the Project Area.

#### ***Queen Charlotte (Northern) Goshawk (*Accipiter gentilis*)***



#### ***Affected Environment***

The northern goshawk inhabits forested lands throughout North America, favoring dense stands of conifer or deciduous old-growth for nesting habitat (USDA Forest Service, 1997a). The Queen Charlotte goshawk is recognized as a distinct subspecies found only in the coastal areas of British Columbia and Southeast Alaska. Eighty-one percent of the confirmed and probable nest sites of this subspecies in Southeast Alaska are south of Frederick Sound (Queen Charlotte Goshawk Status Report for R10 Sensitive Species Consideration, USDA Forest Service, 1991). In Southeast Alaska, the goshawk appears to be non-migratory, although it may occupy different, or overlapping, breeding and winter territories (USDA Forest Service, 1997a).

The Queen Charlotte goshawk is both a Forest Service sensitive species and former candidate species. Concern exists over the viability of goshawk population in Southeast Alaska due to reductions in the amount of this species preferred habitat – mature and old-growth forests – as a result of timber harvesting (USDA Forest Service, 1997a). In 1994, the USFWS received a petition to list the Queen Charlotte goshawk under the ESA. The USFWS decided not to list the goshawk at that time, or again in 1997, largely on the basis of protective measures included in the Forest Plan.

Goshawks make extensive use of productive old-growth forests for foraging and nesting in Southeast Alaska. Landscape factors such as slope and elevation, along with beaches, riparian, and estuaries, are important to goshawk habitat suitability. Riparian zones ranked as the most important landscape component used by radio-collared goshawks (Iverson et al., 1996). Radio-tracking results also indicate that goshawks make extensive use of areas within 1,000 feet of beaches and estuaries (Titus, ADF&G, unpublished data cited in USDA Forest Service, 1998b). Beach, estuary, and riparian habitats generally support greater prey diversity and net prey productivity, features which are important to goshawk habitat quality (USDA Forest Service, 1997b).

Estimates of goshawk home range size vary considerably. Crocker-Bedford (1990) estimated home range size to range from 6,000 to 8,000 acres. Iverson et al. (1996) reported female and male use areas ranging from 9,469 to 11,425 acres.

Forest Plan standards and guidelines require maintenance of at least 100 acres of POG generally centered around the nest tree (USDA Forest Service, 1997b). Iverson et al. (1996) evaluated a variety of silvicultural techniques and concluded that goshawk habitat theoretically could be maintained across the landscape under a 300-year rotation. Recommended conservation options for the goshawk, as set forth during the Viability Synthesis Workshop in June 1995, include: (1) the maintenance of POG within large watersheds such that at least 33 percent of the watershed has 100 to 200-year-old stands and 33 percent has 200 to 300-year-old stands, and (2) the maintenance of at least 600 acres of nesting habitat in each 10,000 to 30,000-acre watershed (USDA Forest Service, 1997b).

A “coarse filter” analysis of GIS data layers was conducted to quantify the amount of high probability goshawk nesting habitat, which currently exists in the Project Area. High



probability goshawk nesting habitat was defined as: (1) high volume strata forest, (2) less than 1,000 feet elevation, and (3) slopes less than 60 percent. Approximately 5,402 acres of high probability goshawk nesting habitat currently exist in the Project Area (Table 3-25). Most nesting habitat is located along the shoreline, in the Glacier Creek drainage, Madan Bay, and in the lower Moose Creek drainage.

Surveys were conducted in the Project Area according to the Region 10 protocol in 1997 and 1998. An active nest was located in the Madan OGR (personal communication, P. Robertson, wildlife biologist, USDA Forest Service, Wrangell R.D., April 22, 1999). See the Wildlife Resource Report (Griffin, 1999) for details. All completed data forms are located in the project files.

## ***Environmental Effects***

The Forest Plan has specific protective standard and guidelines to address goshawk habitat in VCUs where more than 33 percent of the productive old-growth forest has been harvested. The Forest Plan also provides for goshawks on a forest-wide basis, through the old-growth reserve system. This system of large, medium, and small OGRs is intended to broadly provide sufficient habitat for goshawks within the Tongass National Forest. The Project Area does not have significant past harvest and, therefore, does not have specific standards and guidelines for maintaining goshawk habitat. The known nest site within the proposed Madan OGR would be fully protected beyond the Forest Plan standards and guidelines for nest protection because of the added protection of being located within the OGR under all action alternatives. Any newly discovered goshawk nests will be protected by the standards and guidelines for nesting habitat in the Forest Plan. Loss of high probability goshawk nesting habitat associated with the alternatives would range from 409 acres (8 percent) in Alternative 4 to 542 acres (10 percent) in Alternative 2 (Table 3-25). These values for each alternative reflect the retention left within units by determining post-harvest volume within each unit based on the prescription.

## ***Plants***

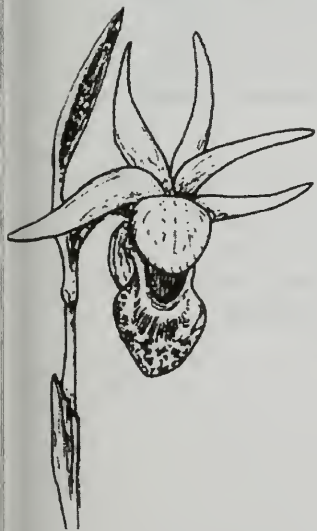
### ***Affected Environment***

Eight plant species listed as Sensitive in Region 10 are known or suspected to occur in the Wrangell Ranger District of the Tongass National Forest. These are listed in Table 3-28.

### ***Environmental Effects***

Field surveys in 1997 and 1998 located two populations of Choris bog orchid (*Platanthera chorisiana*) (recently removed from the Forest Service sensitive species list) and one population of plants tentatively identified as slender bog orchid (*Platanthera gracilis*) within the Project Area. The identification of this specimen was inconclusive.

All known occurrences of sensitive plant species and suspected sensitive plant species occur outside of proposed road corridors, timber harvest units, and log transfer facilities. Consequently, no direct or indirect effects on sensitive plant species are expected to occur; however, because several of these species are fairly widespread, yet-undiscovered populations may be affected by the project. Impacts to unknown individual plants might occur; however, it is unlikely that any such impacts would lead to the listing of any plant species.



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Table 3-28.

#### Sensitive Plant Species Known or Suspected to Occur in the Wrangell Ranger District

Common Name	Scientific Name	Occurrence <sup>1</sup>
Goose-grass sedge	<i>Carex lenticularis</i> var. <i>dolia</i>	S
Edible thistle	<i>Cirsium edule</i>	S
Davy mannagrass	<i>Glyceria leptostachya</i>	K
Wright Filmy fern	<i>Hymenophyllum wrightii</i>	K
Truncate quillwort	<i>Isoetes truncata</i>	S
Calder lovage	<i>Ligusticum calderi</i>	S
Bog orchid	<i>Platanthera gracilis</i>	S
Loose-flowered bluegrass	<i>Poa laxiflora</i>	S

<sup>1</sup> S = Suspected, K = Known

## Threatened and Endangered Species

### Wildlife

#### Affected Environment

The humpback whale (*Megaptera novaeangliae*) and the Steller sea lion (*Eumetopas jubatus*) are the only two federally listed species that occur within the boundaries of Tongass National Forest in the vicinity of the Project Area.

Humpback whales are found in coastal areas or near oceanic islands and appear to occur primarily in nearshore waters, especially the highly productive fjords of Southeast Alaska and Prince William Sound (Calkins, 1986). Humpbacks remain in the Gulf of Alaska through the summer and fall and begin their migration in November; however, some humpbacks have been reported to winter in Southeast Alaska waters (Calkins, 1986). Critical habitat has not been designated for this species; however, Frederick Sound, located approximately 15 miles north of the project area, is an area heavily used by humpbacks during the summer and fall (USDA Forest Service, 1997a). Humpback whales have been observed in the Eastern Passage/Back Channel, between Wrangell Island and the mainland.

The Steller sea lion is widely distributed over the continental shelf and throughout the coastal waters of the Gulf of Alaska (Calkins, 1986). Steller sea lions are known to use the waters of Clarence Strait on the southwest side of Zarembo Island, which is approximately 10 miles west of the Project Area. Steller sea lions have also been observed in the Eastern Passage, between Wrangell Island and the mainland.

## ***Environmental Effects***

No Steller sea lion haul-outs or concentrations of humpback whales have been documented in the project area. There is a low probability that humpback whales and/or Steller sea lions could be temporarily disturbed by the increased boat and barge activity in the areas of the LTFs during implementation of the project. However, because none of these species are known to breed or have significant foraging activity in the Project Area, no adverse effects would be expected as a result of the Madan project.

## ***Plants***

### ***Affected Environment***

No threatened or endangered plant species are known or suspected in the Project Area. Field surveys conducted in the project area in 1997 and 1998 also did not detect any threatened or endangered plant species (Wetlands and TES Plants Resource Report, Kerschke and Arnett, 1999).

## ***Environmental Effects***

Because no threatened or endangered plant species are known or suspected in the project area, no direct or indirect effects on threatened or endangered plant species are expected (Wetlands and TES Plants Resource Report, Kerschke and Arnett, 1999).

## **Other Wildlife Species**

Other wildlife species of interest include former candidate species under the Endangered Species Act (ESA) and species valued highly by the public. Five former candidate species are known or suspected to occur within the project area. Four of these species, the spotted frog (*Rana pretiosa*), the Kittlitz's murrelet (*Brachyramphus brevirostris*), the harlequin duck (*Histrionicus histrionicus*), and the olive-sided flycatcher (*Contopus borealis*) are discussed in the Wildlife Resource Report (Griffin, 1999). One species, the marbled murrelet, is discussed below because surveys indicate that nesting could occur in the Project Area. The moose (*Alces alces*) is also discussed below because of its importance as a game and subsistence use species. Other wildlife species of interest are discussed in the Wildlife Resource Report; these species with high public interest include the great blue heron (*Ardea herodias*), waterfowl, and neotropical migratory birds.

The U.S. Fish and Wildlife Service has received a petition to list the Kittlitz's murrelet as an Endangered Species. The petition also requests that critical habitat be designated for the species. This small diving seabird breeds only in certain sections of coastal Alaska and to a limited extent in the Russian Far East. The largest known populations occur in Southeast and south central Alaska. Sometimes referred to as the "glacier murrelet", the Kittlitz's murrelet forages almost exclusively at the face of tidewater glaciers or near the outflow of glacier streams, and nests in the alpine areas in bare patches among the ice and snow. The LeConte Glacier is the tidewater glacier closest to the project area, on the mainland. It is located approximately 18 miles northwest of the project area. It is unlikely that any Kittlitz's murrelet habitat exists in or near the Madan project area.



### 3 Affected Environment and Environmental Consequences

#### *Marbled Murrelet (*Brachyramphus marmoratus*)*

##### *Affected Environment*

The marbled murrelet is a small seabird found throughout the North Pacific. Murrelets feed on small fish and invertebrates in near-shore ocean areas, inland saltwater and occasionally on inland freshwater lakes. During the breeding season murrelets are more dispersed but will still concentrate in feeding areas during the day. Murrelets are highly mobile in their search for foraging areas suggesting a high level of population interaction.

The marbled murrelet is listed as a threatened species in Washington, Oregon, and California. Concern for this species in Alaska is increasing. The Forest Plan states, "The listing of this species in Washington, Oregon and California and the reductions in habitat from timber harvesting, have raised concerns for the viability of this species in Southeast Alaska" (USDA Forest Service, 1997b). Population trends are considered to be downward for all populations that rely on large, commercially valuable conifers for nesting. Estimates of murrelet numbers in Southeast Alaska range from 45,000 to 250,000 (DeGange, 1996).

Marbled murrelets generally select old-growth stands and large diameter trees as nest sites (Ralph and Miller, 1995; DeGange, 1996). A small percentage (less than 10 percent) of birds may nest on the ground (DeGange, 1996). Large limbs of old-growth trees are the preferred area for nest placement. The importance of canopy cover is unclear. High canopy cover within the stand may limit ease of access to the nest. However, high canopy cover at the nest site is believed to contribute to nest success by concealing nests from predators. Therefore, mid-volume stands with large trees may receive a high amount of use. Due to the difficulty in finding nests, marbled murrelet nesting requirements are not well established in Southeast Alaska. Tree diameters for two nests discovered on Prince of Wales Island ranged between 31 inches to 80 inches dbh (DeGange, 1996). In general, the "best or most important habitat is found within large contiguous blocks of high-volume, low-elevation old growth forest" (USDA Forest Service, 1997b).

The importance of beach and riparian areas to marbled murrelets is largely unknown. Some researchers have found a preference for riparian corridors, indicating that birds may be following stream (openings) to the nest. Three nests located on Prince of Wales varied in their distance from saltwater (0.3 mile, 3.9 miles, 8.1 miles). One study in Southeast Alaska reported the greatest amount of murrelet activity occurring between 1 and 7 kilometers (0.62 and 4.34 miles, respectively) from the coast (DeGange, 1996). Riparian and beach fringe buffers, due to their linear nature and high amount of edge, may be less suitable for nesting (USDA Forest Service, 1997b).

The Forest Plan Standards and Guidelines require protection of nesting habitat around identified murrelet nests. A 600-foot radius buffer is to be maintained around all known nest sites (USDA Forest Service, 1997b). This may be a relatively ineffective management strategy given the difficulty in finding nests (DeGange, 1996). Roads can enter this buffer if unavoidable, but every effort should be made to protect the nest site. Road building and fragmentation of forested areas is believed to increase predation as a result of increased access to marbled murrelet nesting stands by avian predators, especially jays, crows, and ravens (DeGange, 1996).

A "coarse filter" analysis of GIS data layers was conducted to quantify the amount of suitable marbled murrelet habitat that currently exists in the Project Area. Suitable marbled murrelet habitat was defined as medium and high volume forest. Approximately 15,992 acres of suitable marbled murrelet habitat currently exist in the Project Area.

Marbled murrelet surveys, which followed the standards in *Surveying Marbled Murrelets at Inland forested Sites: A guide* (Paton et al., 1990), were conducted in the project area in June 1998. Marbled murrelets were detected at the four survey locations: the mouth of Moose Creek, the head of Madan Bay, Jenkins Cove, and at the mouth of Porterfield Creek. All locations except for at the head of Madan Bay had detections flying inland over forest habitat. See the Wildlife Resource Report for more details (Griffin, 1999). All completed data forms are located in the project files.

### ***Environmental Effects***

Based on survey results, the marbled murrelet appears to nest in old-growth stands in the Project Area, although not in extremely high numbers; therefore, timber harvest would reduce the available nesting habitat. Loss of medium and high volume old growth associated with the alternatives could range from 673 acres under Alternative 5 to 1,131 acres under Alternative 2 (Table 3-25); these acreage values represent a decrease in habitat between 4 and 7 percent, respectively. The values for each alternative reflect the retention left within units by determining the post-harvest volume within each unit based on the prescription. The proposed OGRs, as well as beach fringe and riparian buffers, would also provide habitat for marbled murrelets.

### ***Moose (*Alces alces*)***

#### ***Affected Environment***

Moose are a game and subsistence use species, although subsistence use is very low in the Project Area. High quality habitat is associated primarily with riparian and post-glacial early successional vegetation types. Moose prefer a habitat mosaic containing both young and old forests; clearcuts under 30 years old were used more extensively than unlogged forests (Doerr, 1983). Moose sign was observed at low densities throughout the Project Area; however, high quality habitat is most abundant in the Porterfield and Glacier Creek drainages.

### ***Environmental Effects***

The Virginia Lake OGR protects much of the high quality moose habitat in the Porterfield and Glacier Creek drainages and other high quality habitats in these drainages are outside of proposed harvest areas; therefore, the project would have no effect on these areas. In other areas, harvesting would have short-term benefits to moose by enhancing forage production for about 30 years. After the understory becomes shaded out by closed canopy second growth, the habitat value of these areas would drop to below pre-harvest levels.

Currently, there is little or no moose hunting occurring in the Project Area outside of the Porterfield and Glacier Creek drainages; however, proposed roads could increase access to hunters and result in some harvest in these other areas. Alternatives 3 and 4 would have the lowest potential impacts due to increased access among the action alternatives and among road management options, Option B would have lower potential impacts than Option A.



### **3 Affected Environment and Environmental Consequences**

#### **Cumulative Effects on Wildlife Habitats and Species of Concern**

The Forest Service does not have any other timber activities planned for the Project Area in the foreseeable future, and past timber management has been virtually non-existent (only 34 acres near the mouth of Moose Creek have previously been logged; these acres were harvested in 1959). Although the State of Alaska owns lands both south and north of Mill Creek, there are no timber management plans for these areas within the next 5 years. In addition, the vast majority of the area on the mainland between the Stikine River to the north, the Canadian border to the east, and Behm Canal to the south, consists of unharvested and unroaded National Forest System lands that are protected by non-development LUDs. This extensive mainland unroaded area is actually continuous from the southern tip of Southeast Alaska to the Juneau-Skagway area at the north end. The only planned timber harvest on the mainland near the Project Area is the Crittenden timber sale, which is currently included in the Tongass 10-year Timber Sale Schedule. Neither the Madan nor the Crittenden timber sales would block the continuity of the extensive mainland unroaded area. The proposed Crittenden project lies north of the state land that occurs near the mouths of Mill and Crittenden Creeks.

Although no activities are planned for the next 5 years, state lands south of Mill Creek could more easily be developed under Alternatives 2, 3, and 5. Therefore, these alternatives could contribute to increased effects on habitats and species of concern over the long term. However, the potential additional harvest in this area south of Mill Creek would be slight because of the low abundance of productive forest in this area that is suitable for timber harvest (<100 acres).

Similarly, the Madan timber sale could contribute to cumulative wildlife/species of concern impacts when combined with the Crittenden timber sale. However, the amount of harvest and road building that would result from these projects and the cumulative size of the area potentially affected would not likely create impacts greater than the sum of the individual project impacts. The cumulative effects on species like the brown bear, that are sensitive to human disturbance, are not expected to be significant because roaded areas would be minimal compared with the large expanse of unroaded lands surrounding these projects.

During the life of the Forest Plan, harvest could potentially occur on all suitable forest lands. In the Madan Roadless Area (which includes the Madan Project Area), there are approximately 33,372 acres mapped as productive old growth on National Forest System lands (USDA Forest Service, 2003). Approximately 11,386 of these acres are estimated to be suitable for timber production under the Forest Plan (given estimated falldown and scheduling factors), and could be harvested over the long term. This represents 16 percent of the roadless area or 34 percent of the productive old growth. However, these percentages would decrease if one of the action alternatives in this EIS is selected, because the acreage in Old-Growth Habitat LUDs would increase (see section on Old-Growth Habitat Reserves above), reducing the suitable acres (by about 772 acres, considering falldown and scheduling factors) to approximately 10,607 acres (or 15 percent of the roadless area and 32 percent of the productive old growth).

These long-term reductions in productive old growth would result in long-term reductions in the habitat capabilities of the area for those species that use old-growth habitat. However, the general protections afforded by the Forest Plan (e.g., Forest-wide standards and guidelines) and the system of old-growth reserves in this area, together with the lack of development LUDs adjacent to the Madan Roadless Area (e.g., the Stikine-LeConte Wilderness borders the area to the north and natural setting LUDs dominate areas to the



## Affected Environment and Environmental Consequences **3**

east), would limit these reductions and are expected to maintain well distributed viable populations across the area over the long term. Refer to the Forest Plan Final EIS for elaboration on long-term effects of Forest Plan implementation (the current Forest Plan is similar to Alternative 11 of the Final EIS) on wildlife, biodiversity, and threatened, endangered, and sensitive species (USDA Forest Service, 1997).

## **Issue 4: Road Access Management**

Public concerns were received that questioned the need for road development, as well as road location, design, and access management. Both the direct effects of road building on soils, water, fish, wildlife, and visual quality, and the indirect effects on wildlife, subsistence, and recreation are included in the issue. Both a Forest level as well as a project level Roads Analysis Plan has been developed and is included in the Planning Record.

Forest roads are categorized as classified roads, unclassified roads, or temporary roads. Classified roads are those determined to be needed for long-term motor vehicle access. These roads receive constant or intermittent use depending upon the timing of timber harvest. Classified roads form the primary transportation network in the Project Area. A temporary road is a short-term road developed and maintained for a limited time period. Current timber sale contracts require temporary roads to be decommissioned. This is an erosion control obligation of the timber buyer and cannot be waived. Decommissioning is achieved by blocking access, removing culverts and bridges, restoring the natural surface drainage patterns, and/or putting the roadway back into vegetative production. Unclassified roads are unplanned roads, abandoned travelways, and other roads not managed as part of the forest transportation system.

Less than 10 percent of the Project Area has a Timber Production LUD under the Forest Plan. Management direction includes planning a transportation system that will eventually access most of the suitable timberlands for standard logging or helicopter systems.

### **Existing Condition**

Currently, there are no existing roads in the Project Area. The Stikine-LeConte Wilderness is located to the northeast and a Semi-Remote Recreation LUD is located to the east of the Project Area. The Project Area is part of a vast mainland area, which has no previous road development. There is concern that developing a road system on the mainland in a previously unroaded area will increase hunting pressure on wildlife, potentially deliver sediment to streams, and affect visual and recreation resources. Based on information gathered during subsistence studies, very little hunting occurs in the Project Area. Most of the hunting occurs along the beach fringe area and near the east end of Virginia Lake (see Subsistence Section). Currently, the only publicly-maintained facilities are the float plane dock and cabin at the east end of Virginia Lake and the Mill Creek Trail between saltwater, at the mouth of Mill Creek, and Virginia Lake.

The Madan Roadless Area (Roadless Area 204) contains 69,738 acres. All of the Project Area is contained within this roadless area.

The Forest Plan assigned various LUDs to the area, including the Madan Roadless Area that would allow varying amounts of road development. The LUDs include Old Growth Habitat, Remote Recreation; Semi-Remote Recreation; Wild; Scenic; and Recreation River; Scenic Viewshed; Modified Landscape; and Timber Production.

## **Road Management**

### ***Traffic Management Strategy***

The Forest Service generally implements one or more of five traffic management strategies, as appropriate. These strategies are as follows:

1. **Encourage.** The Forest Service would include destination signing at the entrance to the road in conjunction with a route marker. The road would be shown on Forest visitor maps. Roads having this strategy would be maintained at Level 2.
2. **Accept.** The Forest Service would provide only a route marker at the road entrance. If map clarity can be maintained, the route would be shown on Forest visitor maps. Roads having this strategy would be maintained at Level 2.
3. **Discourage.** Normally this would be accomplished by warning or information signs. Roads having this strategy would be maintained at Level 2 or Level 1.
4. **Eliminate.** The road would be physically blocked to traffic by culvert removal, gates, or berms. Roads having this strategy would be maintained at Level 1.
5. **Prohibit.** In addition to physically blocking the road to traffic, the closure would be legally enforced. Roads having this strategy would be maintained at Level 1.

Traffic management strategies for individual roads in the Project Area are displayed in Appendix F and on each road card in Appendix C..

### ***Road Maintenance Strategy***

Road maintenance includes the repair or upkeep of a road necessary to retain the road's traffic service level. The amount and level of maintenance is dependent upon traffic management objectives and maintenance criteria.

After construction, roads may be maintained at one level during project implementation and maintained at a different level after the Project. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level to which roads in the Madan area would be maintained during the timber sale. The objective maintenance level is the maintenance level to be assigned after timber harvest, considering future road management objectives, traffic needs, budget constraints, and environmental concerns.

Maintenance levels that would be assigned to roads in the Project Area include Level 1 and Level 2 (see below).

1. **Level 1.** This level is assigned to roads during the time they are closed to vehicular traffic.
2. **Level 2.** This level is assigned to roads open for use by high clearance vehicles such as pickup trucks and logging traffic. Passenger car traffic is not a consideration. Traffic is usually minor, usually consisting of one or a combination of log haul, administrative, permitted, dispersed recreation, or other specialized uses.



### 3 Affected Environment and Environmental Consequences

Included in the maintenance strategy are treatments that would be assigned to the roads. One of these treatments is road storage, which is the process of putting a road into a closed condition, which protects resources including soils, water quality, fisheries, and wildlife. Another treatment is stormproofing, which is a process that leaves drainage structures in place, but provides waterbars, rolling dips, outslopes, and other features to ensure controlled runoff until any needed maintenance can be performed on the primary drainage system.

Road maintenance levels including road storage and stormproofing assigned to individual roads in the Project Area are included in the traffic management strategy displayed in Appendix F.

## Effects

All of the alternatives, except Alternative 1, would introduce roads into the Madan Roadless Area and would be consistent with the Forest Plan. Alternative 2 would change the greatest amount of unroaded area and Alternatives 3 and 4 would change the least (see Issue 1: Scenic Quality and Recreation Values).

The proposed road network would be built and maintained for timber management and would not connect to any towns or villages or other road systems. Access to these roads from Wrangell and other outside areas would be by boat or float plane for non-motorized users. Access for highway vehicles would be by tug and barge or landing craft, and access for non-highway vehicles could be provided by boat. New road construction could mean an increase in access to the area for hunters and changes in the patterns of hunting in the Project Area. Hunting and other road-related disturbances could have an adverse impact on species sensitive to human disturbance. Even closed roads would increase walking use of the area, which could increase hunting pressure, disturbance to some species, and increase chances of human/bear interactions (see Issue 3: Wildlife Habitats and Species of Concern).

Alternative 2 would construct the greatest length of road and Alternative 4 would build the least among the action alternatives (Table 3-29). Temporary roads would represent approximately 7 to 13 percent of the road totals.

Table 3-29.  
Miles of Proposed Roads by Road Type and Alternative<sup>1/</sup>

Road Type	Alternative				
	1	2	3	4	5
Specified	0.0	18.6	8.4	5.9	12.9
Temporary	0.0	2.7	0.6	0.8	1.8
<b>Total</b>	<b>0.0</b>	<b>21.3</b>	<b>9.0</b>	<b>6.7</b>	<b>14.7</b>

1/ The road lengths in this table and throughout most of this EIS are GIS lengths, which are typically slightly less than the lengths measured on the ground. Ground lengths are shown on the road cards in Appendix C.

## Road Management Options

Two road management options are being considered for each of the permanent roads in the Project Area. These options incorporate applicable road management and road maintenance strategies. One or more of the options may be assigned to each road. The options are described as follows:

1. **Road Management Option A.** Leave most of the road system open, with selective road closure for short segments of the system. Roads left open following the sale would be stormproofed by providing driveable

waterbars/rolling dips where necessary. Roads scheduled for closure would be placed in storage with drainage structures removed and natural drainage patterns reestablished. Roads would be routinely inspected and maintenance would be performed at Maintenance Level 1 or 2 as indicated on the Road Management Objective form.

2. **Road Management Option B.** All system roads would be closed after timber harvest, either by barrier berm or by placing in storage. Roads closed by berms would be stormproofed by providing driveable waterbars/rolling dips where necessary. Roads would be routinely inspected and maintenance would be performed at Maintenance Level 1.

Table 3-30 shows, by alternative, the traffic management strategy measured in miles for each alternative. Option A leaves most roads open for traffic. Option B closes all roads to public traffic after timber harvest.

### ***Operation and Maintenance Costs***

The long-term (30 years) operations and maintenance costs for the proposed roads are identified in Table 3-31. In general, costs are proportional to the number of permanent road miles constructed under each alternative; therefore, among the action alternatives, Alternative 2 would be the most expensive and Alternative 4 would be the least expensive. Option A and Option B costs would be similar; Option A would result in higher storage and related costs.

### **Geographic Summary**

The sections below summarize the potential effects to the various geographic portions of the proposed road system: Moose Creek, Jenkins Cove, and Virginia Lake.

#### ***The Moose Creek Area***

This road system, which includes the Moose Creek Road (Road 20), extends approximately 3 miles from the LTF near the mouth of Moose Creek up the west side of the creek. It parallels the creek at a distance of about 0.25 mile. The Mountain View Road (Road 2010) forks off about 1 mile up the road and climbs the ridge to the west to access the higher elevation units on the west side of the drainage. Alternatives 2 and 4 would build the entire 6.5 miles of road in the Moose Creek drainage. Alternative 3 would not build the Mountain View Road segment that extends to the west to access the upper drainage (Road 2010); therefore, only 2.6 miles of road would be built. Alternative 5 would not build any roads in the Moose Creek drainage.

No fish-bearing streams are crossed by these roads. This road system may provide access to hunters into areas that have been difficult to access in the past. This may increase hunting pressure, in particular, on mountain goats on Berg Mountain; however, this effect should be very slight because even using this road system to actually reach Berg Mountain would require extreme cross-country hiking for several miles. During project implementation there may be a short-term increase in the use of roads by motor vehicles for recreation or hunting by the crews; however, there would not be a workers camp in this area which is likely to limit road use after work hours.

### 3 Affected Environment and Environmental Consequences

Table 3-30.

#### Miles of Road Managed According to Each Traffic Management Strategy for Options A and B under Each Alternative

		Encourage (miles)	Accept (miles)	Discourage (miles)	Eliminate (miles)	Prohibit (miles)
<b>Alternative 2</b>						
Mountain	Option A	15.0	0	4.3	0	0
Bikes	Option B	15.0	0	4.3	0	0
Hikers	Option A	15.0	4.3	0	0	0
	Option B	15.0	4.3	0	0	0
Non-highway	Option A	0	15.0	4.3	0	0
vehicles	Option B	0	0	0	19.3	0
High	Option A	0	15.0	0	4.3	0
Clearance	Option B	0	0	0	19.3	0
Highway						
Vehicles						
Passenger	Option A	0	0	0	19.3	0
Highway	Option B	0	0	0	19.3	0
Vehicles						
<b>Alternative 3</b>						
Mountain	Option A	7.4	0	1.1	0	0
Bikes	Option B	7.4	0	1.1	0	0
Hikers	Option A	7.4	1.1	0	0	0
	Option B	7.4	1.1	7.4	0	0
Non-highway	Option A	0	7.4	1.1	0	0
vehicles	Option B	0	0	0	8.4	0
High	Option A	0	7.4	0	1.1	0
Clearance	Option B	0	0	0	8.4	0
Highway						
Vehicles						
Passenger	Option A	0	0	0	8.4	0
Highway	Option B	0	0	0	8.4	0
Vehicles						
<b>Alternative 4</b>						
Mountain	Option A	4.6	0	1.5	0	0
Bikes	Option B	4.6	0	1.5	0	0
Hikers	Option A	4.6	1.5	0	0	0
	Option B	4.6	1.5	0	0	0
Non-highway	Option A	0	4.6	1.5	0	0
vehicles	Option B	0	0	0	6.2	0
High	Option A	0	4.6	0	1.5	0
Clearance	Option B	0	0	0	6.2	0
Highway						
Vehicles						
Passenger	Option A	0	0	0	6.2	0
Highway	Option B	0	0	0	6.2	0
Vehicles						



Table 3-30. (continued)  
**Miles of Road Managed According to Each Traffic Management Strategy for  
Options A and B under Each Alternative**

		Encourage (miles)	Accept (miles)	Discourage (miles)	Eliminate (miles)	Prohibit (miles)
<b>Alternative 5</b>						
Mountain	Option A	10.3	0	2.7	0	0
Bikes	Option B	10.3	0	2.7	0	0
Hikers	Option A	10.3	2.7	0	0	0
	Option B	10.3	2.7	0	0	0
Non-highway vehicles	Option A	0	10.3	2.7	0	0
	Option B	0	0	0	12.9	0
High Clearance	Option A	0	10.3	0	2.7	0
Highway Vehicles	Option B	0	0	0	12.9	0
Passenger	Option A	0	0	0	12.9	0
Highway Vehicles	Option B	0	0	0	12.9	0

Table 3-31.  
**Long-term Operation and Maintenance Costs for Proposed Roads**

Maintenance Level 1	\$211/mile/year	Stormproofing	\$5,000/mile
Maintenance Level 2	\$353/mile/year	Gate Installation	\$3,000/gate
		Road Storage	\$15,000/mile
		Reopening of Roads	\$30,000/mile
		Reconditioning of Roads	\$3,000/mile

### **Jenkins Cove Area**

This road system includes all the roads in the Jenkins Cove area south of Gypsy Creek. Alternatives 2 and 5 would build the entire 8.3 miles of road. Alternative 3 would build 5.8 miles of road, which is all but the Upper Madan Road that accesses the upper reaches of the drainage (Road 1020). Alternative 4 would only build 0.2 mile of the road at the LTF and sort yard.

In Alternatives 2, 3, and 5, one Class II and two Class III streams would be crossed. This road system would provide access to hunters after project implementation. This may increase hunting and fishing pressure on fish-bearing streams. During project implementation, motor vehicle use of the road for recreation and possibly hunting by crews could increase disturbance to some wildlife; however, there would not be a workers camp in this area which is likely to limit road use after work hours.

### **Virginia Lake Area**

This road system is a continuation of the road from Jenkins Cove and extends north and east beyond Gypsy Creek into the Virginia Lake area. Alternatives 2 and 5 would build the entire 6.4 miles of road. Alternatives 3 and 4 would not build these roads.

Three Class II streams, including Gypsy Creek, and two Class III streams would be crossed. This road system would provide access to hunters after project implementation.

### 3 Affected Environment and Environmental Consequences

This may increase hunting and fishing pressure and increase general access in the area bordering the Virginia Lake OGR. The Virginia Lake OGR, as an undeveloped and unroaded area, would buffer the effects of hunting and trapping in the Project Area. As in the Jenkins Cove area, during project implementation, motor vehicle use of the road for recreation and possibly hunting by crews could have an increased effect on disturbance to species. This would be a short-term impact while timber harvesting occurred. Under Option B, after project implementation the road would be closed and the access would be limited to walk-in and non-highway vehicles although use of non-highway vehicles, would be discouraged.

#### ***Cumulative Effects***

Over the long term, the existence of roads in the Project Area could increase the likelihood that adjacent state lands south of Mill Creek would be harvested; however, the amount of suitable timber in this area is small relative to the Madan project and very limited road extensions would need to be developed to harvest it. Construction of the Madan project roads also may increase the likelihood of future road construction in the Madan Project Area and development of additional access. However, road extensions beyond the watersheds accessed under Alternative 2 are unlikely, because of the lack of suitable timber necessary to justify the costs of significant additional road construction. Because of topographic, environmental, and economic considerations, it is unlikely that the Madan road system would ever be connected with any other road system, either northwest or southeast.

Timber sales are currently scheduled on the Tongass 10-year Timber Sale Plan in the Crittenden Project Area, north of Madan. During the life of the Forest Plan, harvest and road construction could take place over more of the Madan and Crittenden Project Areas for the purpose of accessing timber harvest units; although roads in these two project areas would not connect, the cumulative result would be increased access into the mainland adjacent to Wrangell Island. This increased access would likely have both negative and positive effects on recreation and subsistence activity, negative effects on wildlife, and positive effects on mineral exploration and development potential.



## **Issue 5: Madan Inventoried Roadless Area**

### **Introduction**

Inventoried roadless areas are National Forest System lands identified as undeveloped lands where there are no improved roads maintained for travel by motorized vehicles intended for highway use and which do not have extensive timber harvest or other developments. Roadless areas have important values and characteristics that are becoming increasingly scarce as other lands are developed. Roadless areas provide places to recreate away from roads and development; clean drinking water; undisturbed landscapes; habitat for plants, birds, fish and other wildlife; and opportunities to study natural ecosystems. Inventoried roadless areas were originally identified during the Roadless Area Review and Evaluation studies (RARE and RARE II) conducted in the 1970s. These studies identified areas that would meet the minimum criteria for inclusion in the National Wilderness Preservation System.

### **Forest Plan Analysis**

During 1997 Forest Plan revision, all National Forest System lands, including unroaded areas, were analyzed. The previously identified inventoried roadless areas were re-examined to determine their LUD. About 74 percent of the inventoried roadless areas in the Tongass National Forest were included in non-development LUDs, such as Remote Recreation or Semi-Remote Recreation. The other 26 percent were assigned to development LUDs that allow timber harvest and road construction. A recently completed evaluation at the Forest Plan level examined whether existing roadless areas should be recommended for wilderness status. A Final Supplemental EIS on this aspect of the Forest Plan revision was published in February 2003. The Regional Forester's decision was not to recommend any additional wilderness in the Tongass National Forest.

### **Madan Inventoried Roadless Area (#204)**

The Project Area is almost entirely included within the Madan Inventoried Roadless Area. The Project Area makes up just over 60 percent of the Madan Inventoried Roadless Area. Appendix C of the Final Supplemental EIS (USDA Forest Service, 2003) presents a detailed evaluation of the Madan Roadless Area (see pp. C1-54 through C1-65 in Volume II). Table 3-32 provides a summary of this roadless area evaluation.

The Forest Plan allocated some parts of the Madan Inventoried Roadless Area to LUDs that allow timber harvest and road construction, and some parts to LUDs that do not allow development (Table 3-33). About 87 percent of the Madan Inventoried Roadless Area is within development LUDs.



### 3 Affected Environment and Environmental Consequences

Table 3-32.

**Summary of Roadless Area Evaluation for the Madan Inventoried Roadless Area – (#204) as presented in USDA Forest Service (2003)**

**Description and Capability for Management as Wilderness** – The Madan Roadless Area is located on the mainland and is bounded on the north by the Stikine-LeConte Wilderness, on the west by the Eastern Passage and an area of state-owned land, on the south by Blake Channel, and on the east by the Aaron Creek divide and Roadless Area #205. The area is 69,126 acres in size (excluding Virginia Lake). There are accessible shorelines for landing small craft and floatplanes when weather conditions are favorable and floatplanes can land on Virginia Lake. The area is generally characterized as highly complex terrain dominated by rugged mountains with deep, broad valleys in between. Dominant waterforms include a relatively small glacier which occupies the highest mountains, Virginia Lake, and the waterfall on Mill Creek. Approximately 9 miles of Virginia Lake and the associated creeks are recommended for designation as a Recreational River in the Wild and Scenic River System. Vegetation is typical Southeast Alaska temperate rain forest. Wildlife include mountain goats, black bear, deer, and an occasional brown bear or moose. Even though there are seven ADF&G numbered fish streams in the area, salmon production is generally low. Some subsistence fishing occurs on Mill Creek for sockeye salmon. Virginia Lake is recognized as a top recreational cutthroat trout fishery. Main attractions include Virginia Lake, the two public recreation cabins, the Mill Creek trail, the opportunity to hunt moose and brown bear, and offshore saltwater fishing. The area has high scenic quality and is essentially unmodified, except for minor effects of mining, fishery enhancement, limited beach logging, and the cabins. The natural integrity, apparent naturalness, opportunity for solitude, and opportunity for primitive recreation are rated very high to outstanding.

**Availability for Management as Wilderness** – The area contains 22,973 acres of tentatively suitable forest land. Based on the Forest Plan LUDs assigned to the area (and estimated falldown and scheduling factors), 11,386 acres, or 16 percent of the roadless area are estimated to be suitable for timber production. Recreation potential includes additional outfitter/guide permits, trails, cabins, or shelters. There is potential for both fish and wildlife resource enhancement projects. There are numerous mining claims and one group has been patented. The area has 5,247 acres of land identified as a mineral activity tract having a high potential for development. This area is a designated Minerals LUD under the Forest Plan. In addition, an estimated 42,239 acres of undiscovered locatable mineral resources exist in the area. Wrangell residents have a high degree of interest in maintaining the integrity of the area around Virginia Lake, but many would like to see development in other parts of the area, including a road link between Wrangell and the Canadian highway system.

**Wilderness Evaluation** – The Madan Roadless Area was rated 25 out of a possible 28 points under the Wilderness Attribute Rating System. As such, it is tied for 12<sup>th</sup> from the highest (along with 12 other roadless areas) among the 109 Tongass inventoried roadless areas. There is both local and national support for management of the area in an unroaded condition, and some support for designation of the area as wilderness. The relative contribution of this area to the National Wilderness Preservation System would be high.

Table 3-33.

**Area (acres) of LUDs on National Forest System Land within the Madan Inventoried Roadless Area and within the Madan Project Area**

<b>LUD</b>	<b>Madan Inventoried Roadless Area</b>	<b>Madan Project Area<sup>1/</sup></b>
<b>Development LUDs</b>		
Timber Production	19,260	3,615
Modified Landscape	18,505	16,700
Scenic Viewshed	22,687	16,077
<b>Subtotal</b>	<b>60,452</b>	<b>36,392</b>
<b>Non-development LUDs</b>		
Old-Growth Habitat	5,874	3,201
Recreational River <sup>2/</sup>	3,214	3,210
Semi-Remote Recreation	198	0
<b>Subtotal</b>	<b>9,286</b>	<b>6,411</b>
<b>Total</b>	<b>69,738</b>	<b>42,803</b>

1/ The Project Area is almost entirely contained within the Madan Inventoried Roadless Area.

2/ The 2003 Final Supplemental EIS showed an acreage of 69,126 for the Madan Roadless Area; however, it did not include the 612 acres of Virginia Lake and the Project Area does include it. Including Virginia Lake brings the total acreage of the area to approximately 69,738 and the total Recreational River LUD acreage to approximately 3,214 acres.

## Evaluation of the Madan Inventoried Roadless Area

The social and ecological values discussed here were identified as characteristics of Inventoried Roadless Areas during the national analysis for the Forest Service Roadless Area Conservation Rule. It is recognized that these characteristics do not necessarily apply equally to all roadless areas. Although the Final Rule does not apply to the Project Area, the evaluation here determines whether, and to what extent, the characteristics identified during the national analysis are affected by the proposed action in the Madan Inventoried Roadless Area.

### *Proximity to Wilderness and Other Inventoried Roadless Areas*

The Madan Inventoried Roadless Area lies in the middle of a vast mainland area with no previous road development. The Stikine-LeConte Wilderness borders the Madan Inventoried Roadless Area on the north. This wilderness is 449,950 acres in size and extends to the north and south of the Stikine River and the LeConte Glacier. Beyond the LeConte Glacier, the roadless character continues to the north inside Inventoried Roadless Areas and wildernesses up to Juneau and Skagway. On the east, the Madan Inventoried Roadless Area is bordered by the Aaron Inventoried Roadless Area, which is 79,147 acres in size. The Madan Inventoried Roadless Area is bordered to the west and south by the Eastern Passage and Blake Channel, respectively. Further east and southeast lie three additional roadless areas, the Cone (127,874 acres), Harding (179,350 acres), and Bradfield (204,133 acres) Inventoried Roadless Areas. These areas extend to and beyond



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the Bradfield Canal, and are bordered by the extensive Misty Fiords National Monument Wilderness and other inventoried roadless areas extending onto the Cleveland Peninsula.

The Forest Plan has allocated the majority of the Madan Inventoried Roadless Area to development LUDs (Table 3-33). The nearby wildernesses would remain as wilderness. The Aaron and Cone Inventoried Roadless Areas are virtually all allocated to non-development LUDs. Large portions of the Harding and Bradfield Inventoried Roadless Areas and other Inventoried Roadless Areas further south are also allocated to non-development LUDs. The majority of the inventoried roadless areas north of the Stikine-LeConte Wilderness are also allocated to non-development LUDs.

A number of relatively small inventoried roadless areas also occur on Wrangell Island, across the Eastern Passage from the Madan Inventoried Roadless Area. The Forest Plan allocates all of these to development LUDs.

#### ***Proximity to Non-National Forest System Lands that could be Developed***

The Madan Inventoried Roadless Area consists of National Forest System lands, and 98 percent of the Project Area is in this category. Approximately 1,300 acres of state land occurs in the Project Area on either side of Mill Creek, between the Eastern Passage and Virginia Lake. This land connects to a more extensive block of state land to the north of Mill Creek in the Crittenden Creek area. A small (50 acres) amount of private land in the Project Area is associated with a mineral patent in the upper portion of the Porterfield Creek drainage. Several active and inactive mines are located in the Porterfield and Glacier Creek drainages within the Project Area. In recent years, the state has identified several potential timber sales in the vicinity of the Project Area and adjacent to the inventoried roadless area. These potential sale areas were identified as the Virgin Point sale (located at the very southern portion of the state land adjacent to the Madan project); the Mill Creek sale (located north of Mill Creek and adjacent to the Madan sale area); and the Crittenden Creek sale (located north of the Mill Creek sale area).

The ADNR is in the process of planning for future land use on state lands in Southeast Alaska. Until all the lands are classified, they will not be scheduled for timber harvest. Of the potential sale areas in the vicinity of the Madan project, the Crittenden Creek sale is considered the most likely to occur and it would probably not occur for at least 10 years (see Lands section in this chapter).

No other blocks of state lands or private lands occur in the vicinity of the Madan Inventoried Roadless Area on the mainland, except for two small parcels of private land inside the Stikine-LeConte Wilderness on the Stikine tideflats. However, extensive state and private lands do occur on Wrangell Island, directly across the Eastern Passage from the Madan Inventoried Roadless Area. These lands are already largely developed with roads, timber management, and the community of Wrangell.

#### ***Amount of Human Disturbance – Past, Present, and Future***

As noted above, the Madan Inventoried Roadless Area is located in the middle of a vast mainland roadless area. As a result, there is little sign of human disturbance inside the Madan Inventoried Roadless Area, nor in adjacent areas. Limited signs of human influence are present along Mill Creek and Virginia Lake, which include a fish pass, trail, and a Forest Service public recreation cabin. Another public recreation cabin, Garnet Ledge, occurs in the northwestern corner of the Madan Inventoried Roadless Area near the mouth of the Stikine River. The only past timber harvest in the area is a 34-acre beach-logged unit near the mouth of Moose Creek, in the southern portion of the Madan Inventoried Roadless Area.



Signs of human presence, however, are extensive across Eastern Passage on Wrangell Island. This area includes the community of Wrangell, the airport, and other associated development, along with substantial timber harvest and associated roads.

Wildfires are rare due to the high amount of rainfall in Southeast Alaska. Most wildfires that do occur are caused by human negligence and result in little resource damage.

### ***Biological Values***

The vegetation within the Madan Inventoried Roadless Area is typical of Southeast Alaska. Most of the area is covered with a mosaic pattern of muskeg and temperate rainforest, much of which is low-productive forest. Berg Mountain and associated ridges on the eastern edge of the Project Area, and at the head of Porterfield and Glacier Creeks, contain alpine habitat. Because of the vast roadless area that surrounds the Madan Inventoried Roadless Area, the habitat types in the Madan Inventoried Roadless Area are not considered unique sanctuaries of biological diversity.

Extensive areas of beach and estuary plant associations are found along the saltwater shorelines of the roadless area. Much of this shoreline length lies within the Madan OGR and within state-owned land. These shoreline habitats also occur outside the Madan Inventoried Roadless Area within adjacent roadless areas.

The old-growth habitat reserve system of the Forest Plan is a system of large (approximately 40,000 acres in size or greater), medium (approximately 10,000 acres in size or greater), and small old-growth habitat reserves designated across the Tongass National Forest to ensure long-term species viability and to maintain biodiversity. Three small OGRs, one north of Crittenden Creek, one north of Virginia Lake, and one between Madan Bay and Moose Creek, occur in the Project Area. These small OGRs, along with beach and estuary fringe and riparian areas, enhance the connectivity among the large reserves associated with non-development LUDs in adjacent Inventoried Roadless Areas and wildernesses. Landscape connectivity among OGRs was reviewed during the analysis for the Project Area in cooperation with the USFWS and ADF&G. See the Old Growth Habitat Reserves section of Issue 4 in this chapter for more information.

Inventoried roadless areas may have value as habitat for wildlife species with large home ranges, such as wolf or brown bear. The Madan Inventoried Roadless Area, in conjunction with the rest of the mainland, provides habitat for both species (see the sections on wolves and brown bear in this chapter).

The only threatened or endangered species that are known to occur near this inventoried roadless area are marine mammals, which would not benefit from this habitat (see the Threatened and Endangered Species section of this chapter). Four sensitive wildlife species are suspected or known to occur within the Project Area. Two of these species, the trumpeter swan and the osprey, have standards and guidelines in the Forest Plan that provide protection of nest sites and significant wetland habitats, and are not likely to be affected whether the Madan Inventoried Roadless Area is managed in a roadless condition or not.

One species, the Peale's peregrine falcon, passes through the region, especially during spring and fall. Peregrine falcon nest sites are closely associated with large seabird colonies on high cliffs; however, the species is not known to nest or forage in the Project Area.

The Queen Charlotte goshawk is discussed below because this species is known to nest within the Project Area. Approximately 5,402 acres of high probability goshawk nesting habitat currently exist in the Project Area (Table 3-25). Most nesting habitat is located

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along the shoreline, in the Glacier Creek drainage, Madan Bay, and in the lower Moose Creek drainage. An active nest has also been located in the Madan OGR.

Eight sensitive plant species are also known or suspected to occur in the Wrangell Ranger District and potentially in the Madan Inventoried Roadless Area. Two of these are known and six are suspected.

Seven ADF&G numbered fish streams are present in the Madan Inventoried Roadless Area; however, salmon production is generally low relative to other Southeast Alaska stream systems. A fish pass has been constructed at the mouth of Mill Creek and sockeye salmon are now returning to Virginia Lake and its tributaries. Virginia Lake is regionally recognized as providing one of the top cutthroat trout fisheries in Southeast Alaska and there is a locally important subsistence sockeye fishery at the mouth of Mill Creek.

No non-native wildlife species are known to occur in the Madan Inventoried Roadless Area. Tansy ragwort, an invasive and exotic plant species, has appeared near Ketchikan, about 70 miles south of the Madan Inventoried Roadless Area.

#### ***Recreational Values***

Virginia Lake is the major recreation feature of the Madan Inventoried Roadless Area, attracting people by floatplane and on the Virginia Lake Trail from saltwater (along Mill Creek). The public recreation cabin, the cutthroat trout fishing, the offshore saltwater fishing, the scenery associated with the mainland setting, and the opportunity to hunt moose and brown bear are features of special interest in this area. Another public recreation cabin, Garnet Ledge, occurs near the mouth of the Stikine River in the northwestern corner of the roadless area.

The area is accessible by boat from the community of Wrangell in less than one hour on somewhat protected waters. A low level of deer, black bear, and mountain goat hunting also occurs in the area.

#### ***Cultural or Historical Values***

The area was originally inhabited by the Tlingit in prehistoric times. A sawmill and a stampmill operated at the mouth of Mill Creek during the early 1900s.

While the Madan Inventoried Roadless Area is close to the mouth of the Stikine River and includes a site identified as an early Stikine Tlingit village, relatively few heritage resources were identified during heritage resource surveys for the Madan project. Three heritage resource sites were recorded in the Project Area, including a shell midden of cultural origin, an intertidal, wood stake fish weir complex with a nearby Culturally Modified Tree, and a short-term campsite with petroglyphs. A karst feature (friatic tube) within the Project Area containing a stone artifact, a bone tool, and a shell bead was also discovered (see Heritage Resources section in this chapter). There are also previously recorded petroglyphs and a Tlingit village overlain by the historic mill on state land. The majority of these sites are considered eligible for the National Register of Historic Places.

#### ***Research Values/Reference Landscapes***

Several Research Natural Areas were established with the Forest Plan for the purposes of research, monitoring, education, and/or to maintain biological diversity. Other non-development LUDs, such as Semi-Remote Recreation, Primitive Recreation, Special Interest Area, and Wilderness, may also provide these opportunities.

Because of the extensive system of mainland roadless areas and wildernesses that the Madan area is part of, it does not provide unique research or scientific values that would



be compromised if it were developed. However, its proximity to Wrangell means that it can be more efficiently used for research or education purposes than many other areas.

## Direct Effects on the Madan Inventoried Roadless Area

This section describes the effects of the project on the Madan Inventoried Roadless Area in terms of the size of the roadless area after project implementation. Table 3-34 displays these effects.

In all alternatives, the Madan Inventoried Roadless Area would still maintain the area that contains the highest values for resources other than timber management. It would qualify as an inventoried roadless area and would still be eligible for inclusion in the National Wilderness Preservation System because it would still have more than 5,000 acres with no roads or harvested areas.

Table 3-34.  
Effects on the Madan Inventoried Roadless Area by Alternative

Measure of Effect	Alternative				
	1	2	3	4	5
Harvest unit acres within roadless area	0	2,105	1,719	1,769	1,353
Miles of new road within roadless area	0	21.3	9.0	6.7	14.7
Size of roadless area remaining (acres)	69,738 <sup>1/</sup>	63,886 <sup>2/</sup>	65,980 <sup>2/</sup>	67,808 <sup>2/</sup>	65,808 <sup>2/</sup>

<sup>1/</sup> The 2003 Final Supplemental EIS showed an acreage of 69,126 for the Madan Roadless Area; however, it did not include the 612 acres of Virginia Lake and the Project Area does include it. Including Virginia Lake brings the total acreage of the area to approximately 69,738.

<sup>2/</sup> Future roadless area sizes were estimated by subtracting the acreage of future developed areas from 69,738. Future developed areas were defined using the same rules as were followed for the 2003 Final Supplemental EIS (i.e., all areas within 1,200 feet of roads or within 600 feet of harvest units were considered developed, except for isolated helicopter units).

### Alternative 1—No-Action Alternative

No activities are proposed and there would be no effect on the Madan Inventoried Roadless Area.

### Alternative 2

Alternative 2 proposes to harvest approximately 32 MMBF from approximately 2,105 acres. It involves the development of approximately 21 miles of road, including 3 miles of temporary road. It constructs LTFs at Moose Creek and Jenkins Cove. This alternative focuses on establishing the infrastructure in this initial entry for use in subsequent entries. It employs a variety of harvest methods including helicopter, live and running skyline, and high lead systems. It generally relies more on conventional silvicultural prescriptions, as in clearcuts with minimum 10 percent volume retention.

Following the same rules for defining developed areas as were used for the 2003 Final Supplemental EIS (see footnote 2 to Table 3-34), 5,852 acres of roadless area would be developed. These proposed management activities are consistent with the Forest Plan.



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The maximum effect of Alternative 2 on the Madan Inventoried Roadless Area would be to decrease its size by about 8 percent, from approximately 69,738 acres to approximately 63,886 acres. The area that contains the highest values for resources other than timber management would not be roaded.

#### ***Alternative 3***

This alternative proposes to harvest approximately 19 MMBF from approximately 1,719 acres. It involves the development of approximately 9 miles of road, including 1 mile of temporary road. It constructs LTFs at Moose Creek and Jenkins Cove. Alternative 3 reduces road construction and acres of treatment within the Moose Creek watershed and defers road construction and timber harvest entirely within the Virginia Lake watershed. It also reduces road construction within the Jenkins Cove and Gypsy Creek watersheds. It retains conventional harvest prescriptions and methods adjacent to the constructed road segments, but proposes individual/group selection harvest by helicopter with approximately 25 percent stem removal for the majority of the suitable timber within the Jenkins Cove watershed.

Following the same rules for defining developed areas as were used for the 2003 Final Supplemental EIS (see footnote 2 to Table 3-34), 3,758 acres of roadless area would be developed. These proposed management activities are consistent with the Forest Plan.

The maximum effect of Alternative 3 on the Madan Inventoried Roadless Area would be to decrease its size by about 5 percent, from approximately 69,738 acres to approximately 65,980 acres. The area that contains the highest values for resources other than timber management would not be roaded.

#### ***Alternative 4***

Alternative 4 proposes to harvest approximately 19 MMBF from approximately 1,769 acres. It involves the development of approximately 7 miles of road, including 1 mile of temporary road. It constructs LTFs at Moose Creek and Jenkins Cove. Alternative 4 emphasizes helicopter harvest and minimizes road construction. This alternative defers all treatment and constructs no roads within the Virginia Lake watershed (as in Alternative 3) and also throughout most of the Gypsy Creek watershed. Within the Jenkins Cove watershed, all harvest would be by individual or group selection.

Following the same rules for defining developed areas as were used for the 2003 Final Supplemental EIS (see footnote 2 to Table 3-34), 1,930 acres of roadless area would be developed. These proposed management activities are consistent with the Forest Plan.

The maximum effect of Alternative 4 on the Madan Inventoried Roadless Area would be to decrease its size by about 3 percent, from approximately 69,738 acres to approximately 67,808 acres. The area that contains the highest values for resources other than timber management would not be roaded.

#### ***Alternative 5***

Alternative 5 proposes to harvest approximately 21 MMBF from approximately 1,353 acres. It involves the development of approximately 15 miles of road, including 2 miles of temporary road. It constructs an LTF only at Moose Creek. Alternative 5 defers all treatment within the Moose Creek watershed in an effort to maintain the integrity of all resource values in this watershed. It maintains future options for harvest and road construction in this watershed. This alternative treats the Virginia Lake, Gypsy Creek, and Jenkins Cove watersheds at approximately the same level as in Alternative 2.

Following the same rules for defining developed areas as were used for the 2003 Final Supplemental EIS (see footnote 2 to Table 3-34), 3,930 acres of roadless area would be developed. These proposed management activities are consistent with the Forest Plan.

The maximum effect of Alternative 5 on the Madan Inventoried Roadless Area would be to decrease its size by about 6 percent, from approximately 69,738 acres to approximately 65,808 acres. The area that contains the highest values for resources other than timber management would not be roaded.

### **Cumulative Effects**

Cumulative effects on roadless areas were analyzed at the Forest Plan level. The decision was made to allocate the Inventoried Roadless Areas to either development or non-development LUDs. During the analysis for the Forest Plan, the values of the roadless areas, the location, and the proximity to other roadless areas, especially Congressionally designated wilderness areas, were used to determine which roadless areas would be allocated for development.

No other projects are currently being evaluated in the Madan Inventoried Roadless Area or in adjacent roadless areas; however, additional projects are possible at some point in the future under the Forest Plan, in the Project Area and to the north, in the Crittenden Creek portion of the Madan Inventoried Roadless Area. The Crittenden project is currently scheduled for sale in 2007 and 2011 under the current Tongass 10-year action plan. Although not currently planned, harvest on state lands adjacent to the Madan project in the north is also possible in the future. A small project on National Forest System lands has been implemented along the southern edge of the Harding Inventoried Roadless Area, about 8 miles southeast of the Madan Inventoried Roadless Area, and additional sales are possible in this area at some point in the future. Even if all of these projects are developed, only a small portion of the vast mainland roadless area that includes the Madan Inventoried Roadless Area would be roaded.

There are 5.8 million acres of Congressionally designated wilderness within the Tongass National Forest. These areas will remain as wilderness in perpetuity. Of the remaining 9.6 million acres of land that are currently in inventoried roadless areas, over 95 percent will remain in an unroaded condition during the life of the current Forest Plan. Approximately 74 percent of Tongass roadless areas are within non-development LUDs, which are not planned for development, even over the long term (USDA Forest Service, 2003).

### **National Roadless Area Conservation Rule**

The final Roadless Area Conservation Rule was published in the Federal Register on January 12, 2001. This rule establishes prohibitions on road construction, road reconstruction, and timber harvesting in Inventoried Roadless Areas on National Forest lands, with a few exceptions. The intent of this final rule is to provide lasting protection for Inventoried Roadless Areas within the National Forest System in the context of multiple-use management.

This rule is the subject of a number of lawsuits. Also, in 2001 the Secretary of Agriculture began a review of the rule and interim directives have been issued by the Agency regarding roadless area management. However, regardless of the final resolution of the lawsuits and the rule review, the decision for this Project should not be affected because of a mitigation measure included in the final rule:

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“The final rule applies immediately to the Tongass National Forest but adopts a mitigation measure that both assures long-term protection and a smooth transition for forest dependent communities. The final rule provides that the prohibitions do not apply to road construction, reconstruction, and the cutting, sale or removal of timber from inventoried roadless areas on the Tongass National Forest where a notice of availability for a draft environmental impact statement for such activities has been published in the Federal Register prior to the date of publication of this rule in the Federal Register. This mitigation measure allows an adjustment period for the timber program in Southeast Alaska, but will also assure more certain long-term protection of the Forest’s unique ecological values and characteristics.”  
(Federal Register p. 3254-3255)

The Notice of Availability for Madan Project Area Draft Environmental Impact Statement was published in the Federal Register on June 23, 2000; therefore, the final rule does not apply to this project. The Madan project is consistent with the Revised Tongass Land Management Plan.



## Other Environmental Considerations

In addition to the significant issues addressed in the previous sections, a number of other issues were identified during scoping. The effects of the project relative to these issues are briefly described in the following subsections. More detailed descriptions of these effects can be found in the relevant Resource Reports cited in the appropriate sections.

### Geology and Mineral Resources

The geology of the Project Area includes metamorphosed mudstones, siltstones, and sandstones, some quartzite interlayered with marble and volcanic rocks, and granitic and metamorphosed granitic-type rocks. The landforms in the area can be characterized by glaciated u-shaped valleys typical of most mainland watersheds. Valley sideslopes are generally steep and are frequently dissected by deeply incised v-notch drainages. Mineral development potential within the Project Area is associated with the granitic-type rocks and includes silver, lead, and zinc. Several active and inactive mines are located in the Porterfield Creek drainage and Glacier Creek drainage.

#### *Effects of Alternative 1*

There would be no direct or indirect effects to mineral exploration and existing mining claims in the Project Area under the No-Action Alternative.

#### *Effects of Alternatives 2, 3, 4, and 5*

With the exception of rock quarries needed for project-related roads, mining is not part of any of these alternatives. All recorded mining activity currently occurs in the Porterfield and Glacier Creek drainages. The effects of the action alternative on mining activity are related to the development of road access. Under all alternatives, there is no road construction proposed in or near the Porterfield drainage and very limited road development proposed in the Glacier Creek drainage under Alternatives 2 and 5. There would be no direct effect of timber harvest or road construction on mining claims.

Exposed rock formations in road excavations and quarries resulting from road construction would enable mining interests to conduct more reliable examination of the area. This could be an indirect effect of the project. Whether or not this advantage would result in more mining claims or a change in mining activity could not be determined until the rock is examined.

#### *Cumulative Effects*

The extension of the road network in the future may increase the potential for mineral development in the Porterfield and Glacier Creek drainages as accessibility to the watershed increases. In addition, accessibility by roads increases the opportunity for mining claims within the Project Area. Any future mineral development in the Project Area would be subject to Forest Plan standards and guidelines, including environmental review.

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#### **Karst and Cave Resources**

Geologic mapping done by David Brew (1997) identified marble bedrock in the Project Area, which suggested that karst terrain was present. Karst and cave inventories conducted in the area have identified numerous caves from sea level to the alpine and additional areas with marble. Many of the caves have been surveyed through cooperative efforts of the Forest Service and the Tongass Cave Project (unpublished reports).

In planning the Madan timber sale, reconnaissance surveys were conducted during the course of road location and unit design by road locators, timber sale layout crews, and resource specialists, including geologists. Detailed karst and cave surveys were conducted during 1998 and 1999 by Forest Service personnel and members of the Tongass Cave Project. These surveys identified areas that are underlain by carbonate rock in the form of marble. Some of these areas contain significant karst features and caves (Landau, 1999). A vulnerability assessment was made for all areas underlain by carbonate bedrock. Some areas were determined to have a high vulnerability rating, and under Forest Plan standards and guidelines (1997) will be removed from the suitable timber base.

The vulnerability rating system is described in Appendix I of the Forest Plan (1999). The high vulnerability areas have well developed karst with known caves and associated archeological and paleontological resources. Moderate vulnerability was assigned to areas with karst surface features (e.g., sinkholes). There are no known caves in the area with a moderate vulnerability rating. A low vulnerability category was assigned in areas where there were no apparent dissolution features, and little or no surficial evidence of the carbonate bedrock. A vulnerability map is included in the planning file for this project.

In general, the marble that forms the karst landscape in the Project Area is in thin bands within larger bodies of metasedimentary rocks. The marble is found intermittently across the Wrangell Ranger District from the mainland, south of Blake Island in the back channel, north to LeConte Bay. Marble outcrops in the alpine areas are easier to locate than at low elevations where it is covered by dense vegetation. Additionally, low elevations have typically been overridden by glaciers, depositing a layer of glacial till over the underlying bedrock.

The karst in the Madan area is unique in part because of its rarity in the area. In comparison to extensive areas of karst found on Prince of Wales Island and the smaller islands to the west, the acreage of karst in the Project Area is only 460 acres. Even so, significant paleontological remains have been found in one of the caves. In addition, a plant species new to the Wrangell Ranger District was located in Unit V-112. Northern golden-carpet (*Chrysosplenium tetrandra*) was found growing on a marble outcrop below a large sink hole. This is one of three known locations for the plant on the Tongass National Forest (personal communication with Mary Stensvold, Region 10 Botanist, July, 1999). Resurgent seeps are common in Unit V-112 at the contact of the marble and a non-carbonate metasedimentary rock.

#### **Effects of Alternative 1**

No direct or indirect effects on caves or other karst features would occur under Alternative 1. The areas identified as high vulnerability karst lands would be managed as such and removed from the timber base.

#### **Effects of Alternatives 2, 3, 4, and 5**

No harvest or road construction would occur in the areas identified as high vulnerability karst. However, some individual karst features, not in areas designated as high



vulnerability karst, occur in areas potentially affected by the action alternatives. These karst features include a small stream flowing into a sink hole with resurgence down slope 50 feet, along the 2010 road (Moose Creek drainage). Numerous sinkholes were located in harvest Unit V-112 near the boundary of V-111, though no caves were found. The area with identifiable karst features will be excluded from timber harvest this entry.

In Alternatives 2, 4, and 5, the sink hole/resurgent stream may be affected by road construction related disturbance. In Alternative 3, the 2010 road would not be constructed, so the karst features would not be affected. During construction of the 2010 road, special measures would be taken to avoid sedimentation of the small stream (a trickle at low flows). Best Management Practices (BMP) #13.1, 13.2, 13.10, 14.1, and 14.2 would be incorporated for the protection and avoidance of impacts to the resurgent stream. Units V-111 and V-112 have received preliminary field verification and appropriate mitigation measures applied. If additional karst features are discovered, they will be protected as appropriate.

## ***Cumulative Effects***

No cumulative effects on karst and cave resources are expected because of the identification and mapping of high vulnerability karst lands and karst features and the mitigation of individual karst features within the Project Area.

## **Soil Resources**

While soils provide the foundation for forest growth and ecosystem health, they can also damage valuable aquatic resources when transported into streams and rivers. Timber harvest and road building can damage the ability of soils to support the forest. For this reason, soils and the geomorphic processes that transport soils to the aquatic environment are discussed together. Geomorphic processes in the forest include a variety of landslide types (mass wasting) and erosion of exposed soil (surface erosion). These processes occur naturally in the forested mountains of Southeast Alaska; however, timber harvest and logging roads can increase the frequency and magnitude of mass wasting and surface erosion. For mass wasting to impact the aquatic environment, the debris must be delivered to water bodies. This link between mass wasting features and water bodies is termed "deliverability."

## ***Soil Productivity***

Soil productivity is the inherent capacity of a soil to support the growth of specific plant communities (FSM 2554.03), and is critical to the forest because it affects the productivity of most other forest resources. Soils provide the foundation for plant growth and timber health. Soils with particular physical, chemical, and biological characteristics generally support a certain plant community type or association. Deep, well-drained mineral soils are the most productive sites for tree growth even though tree rooting is generally shallow. In Southeast Alaska, site productivity generally decreases with increasing soil moisture or shallow water tables. Timber site productivity on poorly to very poorly drained organic soils is generally much lower than on well-drained mineral soils.

## ***Surface Erosion***

Because forest soils are protected by a dense layer of living vegetation and a thick organic layer, surface erosion is virtually nonexistent under natural conditions in Southeast Alaska forests with some exceptions. However, in unstable areas where mass wasting has exposed soils, surface erosion does occur under natural conditions. Additional areas





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where natural surface erosion may occur include exposed soil from root masses of windthrown trees and exposed soil in abandoned beaver impoundments with failed dams.

#### ***Mass Wasting***

Mass wasting in all its various forms (debris avalanches and flows, landslides, rock fall, soil creep, etc.) are natural processes in the Tongass National Forest that may deliver soil, rock, and debris to the aquatic environment. They occur in undisturbed areas and will continue to do so in the future. Landslides generally occur near the surface and are shallow-rapid failures affecting the soil and overlying vegetation. Shallow-rapid failures often occur when the soil is saturated and its natural effective strength is reduced by high soil pore-water pressure. Heavy rainfall often triggers shallow-rapid failures and they usually originate in mid- to upper-slope positions, at the upper ends of small drainages. Deep-seated landslides involve failure of the bedrock underlying the soil and, while larger, they are infrequent. Deep-seated landslides are generally not affected by timber management.

Management activity such as timber harvest and road construction can trigger mass wasting many years following harvest, as tree roots decay. Tree roots contribute to the stability of hillslopes by adding strength to the soil by vertically anchoring the soil mantle to fractured bedrock or other stable substrate. Small roots near the surface reinforce the upper soil layer so that it acts as a membrane to provide lateral strength and increased slope stability. After timber harvest, the roots decay reducing soil strength and the stability of shallow soils on steep slopes. Logging roads can also be a major source of landslides, often because of improper road drainage. Approximately 25 percent of the Project Area occurs on very steep slopes (>72 percent). Much of this area is in the Porterfield Drainage which does not include any proposed timber harvest. The Forest Plan considers these slopes as unsuitable for timber harvest. At the project planning level, however, some of these areas can be harvested based on a site-specific slope-stability assessment. Cliffs, bedrock exposures, landslides, and avalanche tracks are common on these slopes. Planning for the Madan Timber Sale avoided these areas in general. Although some units contain small areas of slopes greater than 72 percent within areas of lesser slopes, these areas are not proposed for harvest except in one case, and if approved by the Soil Scientist, where limited harvest may be necessary to open yarding corridors (Unit V-78).

Approximately 25 percent of the Project Area is classified as having very high (MMI4) slope stability hazard (MMI4) and 11 percent as high slope (MMI3) stability hazard (MMI3). The rating reflects the natural stability or instability of a slope under normal conditions. Soils with an extreme rating are excluded from the suitable forest land base of the Tongass National Forest.

#### ***Effects of Alternatives 2, 3, 4, and 5 due to Mass Wasting***

Landslides are most likely to occur when timber harvest and road construction occur on soils with high to extreme hazard ratings. The pre-field and field verification processes eliminated most areas from the harvest unit pool that were on slopes with very high slope stability hazard (MMI4). Several harvest units contain patches of MMI4 soils; however, no timber harvest is proposed in these areas of MMI4 soils, except for limited harvest to open yarding corridors for Unit V-78 under Alternatives 2 and 5. There are approximately 185 to 547 acres of proposed harvest on slopes with a moderate slope stability hazard. Alternative 4 has the greatest acreage of high hazard (MMI3) area proposed for harvest followed by Alternatives 2, 3, and 5, respectively (Table 3-35).

There are no roads proposed to be constructed on slopes with very high slope stability hazard, except for short segments of Road 20 in the Moose Creek drainage under

Alternatives 2, 3, and 4. Several miles of road are proposed to be constructed on MMI 3 soils in each of the action alternatives. Appropriate BMPs would be implemented to reduce potential road failures in these mass-wasting sensitive areas.

### ***Timber Harvest-related Soil Disturbance***

Soil disturbance during timber harvest can reduce the ability of the organic mat and the mineral soil to absorb water, thereby making increased surface erosion possible. Soil disturbance and associated soil erosion can contribute to reduced soil productivity. Alternative 2 would have the highest ground disturbance associated with harvest activity and Alternative 5 would have the least (Table 3-35). In general, surface erosion that occurs within timber harvest units has a limited potential for contributing sediment to streams. The main BMPs to minimize soil disturbance near Class III streams are buffers, controlled felling of trees away from streams, and yarding these trees away from streams (split yarding).

There are approximately 40 acres of MMI4 soils identified and mapped in the units. These isolated, oversteepened slopes will be identified more accurately on the ground and, with one exception, no harvest will occur on them. The exception is in Unit V-78, where up to 2 acres of partial clearing may occur for the purpose of opening up yarding corridors.

### ***Road Construction-related Soil Disturbance***

The construction of roads, landings, and excavation of quarries removes soil from the forest land base. Table 3-35 shows the acres of road-associated disturbance, including quarries and landings, for the action alternatives. Alternative 2 has the highest acreage of road associated disturbance (145 acres) and Alternative 4 has the least (46 acres).

### ***Road-related Surface Erosion***

While surface erosion is not a pervasive problem on the Tongass National Forest, erosion associated with roads can occur and can result in sediment delivery to streams where roads cross them. These effects are both short term, associated with road construction activity, and longer term as erosion of roads and their cut-and-fill slopes occur. Some short-term construction-related erosion is unavoidable and would be mitigated through the application of erosion control measures and BMPs. Long-term erosion of the road prism and associated fill slopes is generally not a concern because the roads are typically constructed of rock borrow excavation. This and the more significant potential for erosion of cut slopes and road surfaces would be addressed by post-construction BMPs that include revegetation, road maintenance, stormproofing, road storage, and decommissioning.

Relative indicators of both short-term and long-term surface erosion include the miles and density of roads and the number of stream crossings (Table 3-35). Alternative 4, with the fewest miles of road, would result in the least short-term impact of the four action alternatives. In contrast, Alternative 2, with the most miles of road, would have the greatest construction-related effect.

Long-term effects take into account the number of road-stream crossings and the potential for failure. Under Road Management Option A, most roads would be left open for public use and periodic maintenance would be required to maintain drainage structures and ditches. Roads left open would be stormproofed and roads scheduled for closure would be placed in storage with high-risk drainage structures removed and natural drainage patterns restored. Under Road Management Option B, all roads would be closed to motorized traffic after harvest, including 4-wheelers and snow machines, and most would



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Table 3-35.  
**Soil Effects Summary**

	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Acres of Harvest	2,105	1,719	1,769	1,353
Acres of Harvest-related Ground Disturbance <sup>1/</sup>	66	41	37	36
Harvest Acres on Very High Slope Stability Hazard (MMI 4) <sup>2/</sup>	2	0	0	2
Harvest Acres on High Slope Stability Hazard (MMI 3)	478	524	547	185
Miles of Road	21.3	9.0	6.7	14.7
Acres of Road-related Ground Disturbance <sup>3/</sup>	145	61	46	100
Road-Stream Crossings	39	19	10	29
Miles of Road on Very High Slope Stability Hazard (MMI 4)	0.2	0.2	0.2	0

1/ Harvest-related disturbance was calculated based upon acres of potential harvest, type of harvest prescription, and type of logging system (Landau, 1999).

2/ Approximately 40 acres of MMI 4 soils are included in harvest units; however, harvest would not occur on these areas, as noted in the unit prescriptions. One exception is that up to 2 acres could be partially cleared to open yarding corridors across an MMI 4 area in Unit V-78 under Alternatives 2 and 5.

3/ Road-related disturbance was calculated based upon assumption that 6.8 acres of soil are disturbed per mile of the road corridor (assuming a 50-foot width).

be placed in storage; they would be maintained to the degree necessary to protect improvements and resource values only. Closures would be implemented using berms or by drainage structure removal. Roads closed with berms would be stormproofed. Stream crossings increase the risk of sediment delivery to streams because of the failure potential of culverts. Alternative 2 has the greatest number of road stream crossings (39) while Alternative 4 has the least number (10) (Table 3-35). The potential failure of the culverts could pose the greatest risk to aquatic resources in the long term. Placing roads in storage virtually eliminates the long-term risk at stream crossings because of drainage structure removal. Stormproofing and routine inspection would be used to reduce risk to other roads.

#### **Cumulative Effects**

The Forest Service does not have any other timber activities planned for the Project Area in the foreseeable future and past timber management has been virtually non-existent (only 34 acres near the mouth of Moose Creek have previously been logged). Although the State of Alaska owns lands both south and north of Mill Creek there are no known timber management plans for these areas within the next 10 years. Timber sales are planned in the reasonable foreseeable future for the Crittenden Creek area north of the state lands; none of the watersheds in this area are shared with the Madan project. Considering only the Madan project, the combined effects of roads and associated



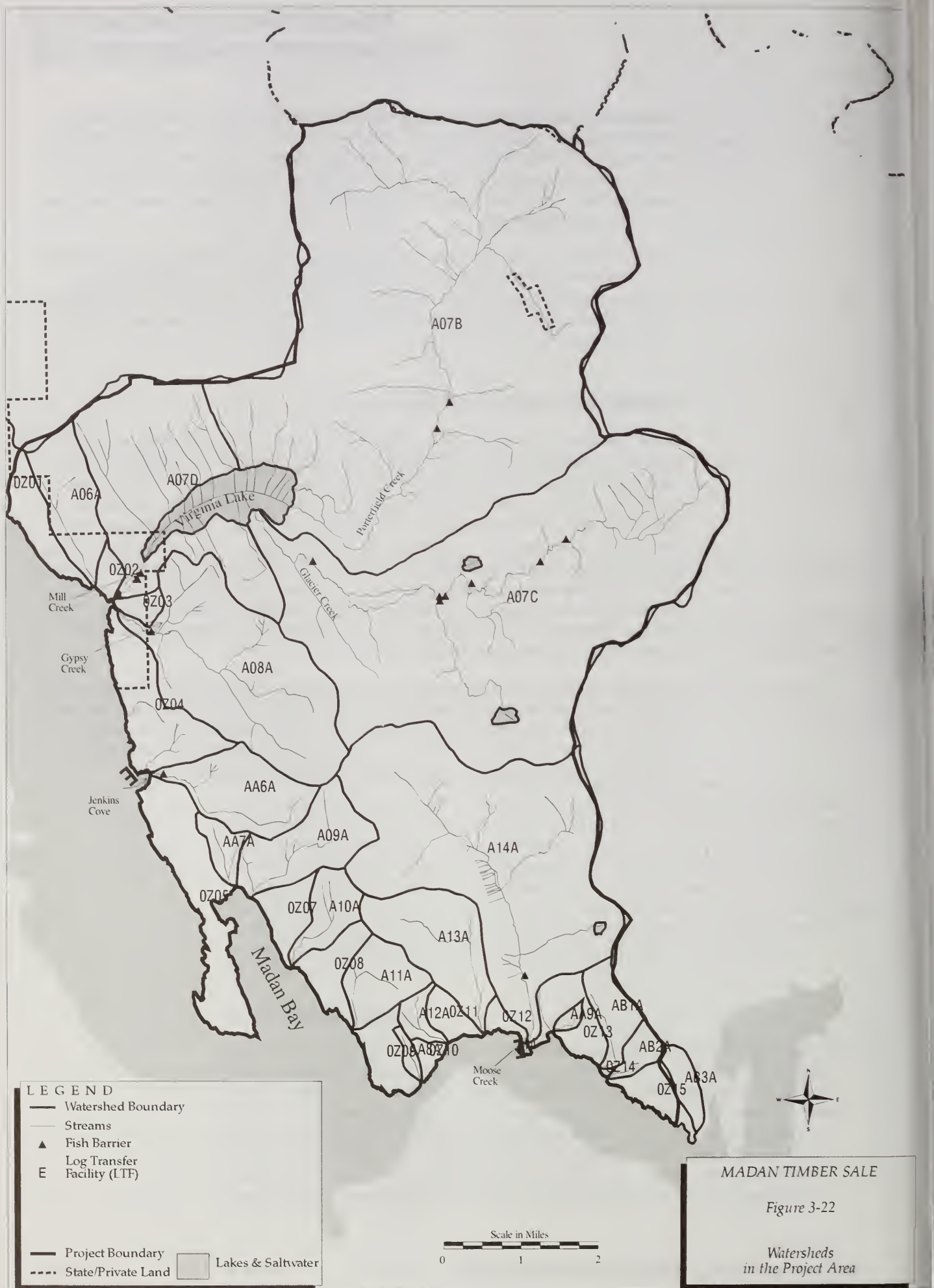
landings and quarries would have the greatest potential for effects on soil productivity, mass wasting, and water resources. The proposed project would build up to 21 miles of new roads in the Project Area in at least eight watersheds. Cumulative effects from road surface erosion and potential mass wasting could occur in the Moose Creek (A14A) watershed and Gypsy Creek watershed which have the most roads and stream crossings of any of the other watersheds.

Over the next 50 to 100 years, harvest and road construction could take place over much of the Madan and Crittenden Project Areas, resulting in considerable additional road development and harvest. The LUDs in the area together with the Forest-wide standards and guidelines defined by the Forest Plan, should prevent significant cumulative effects on soil resources over the long term.

### **Watershed and Fish Resources**

Seven watersheds were selected for evaluation as part of this resource analysis. The selected watersheds include: Porterfield Creek (A07B), Glacier Creek (A07C), Virginia Lake (A07D), Gypsy Creek (A08A), Jenkins Creek (AA6A), Madan Bay (AA7A and A09A), and Moose Creek (A14A) (Figure 3-22). These watersheds were selected for evaluation (prior to the development of the alternatives) because of their potential for project effects. As would be expected, watershed and fisheries resource conditions varied greatly between review watersheds because of the natural variation in drainage area size, land form and cover type, elevation range, stream channel type, and fish access/distribution. Refer to the Madan Watershed and Fisheries Resource Report (Gagner, 1999) for further discussion of watershed selection and greater detail on the watershed and fish resources of the Project Area.

Although watershed and fisheries resource conditions display predictable diversity in the Project Area, past land management activities have been very limited in their scope and relative impact on the existing resource conditions. When compared to other previously managed areas in Southeast Alaska, the watershed and fisheries resource conditions within the Project Area can be characterized as relatively undisturbed by past management.



## ***Porterfield Creek Drainage (A07B)***

The Porterfield Creek drainage is the largest watershed in the study area measuring just less than 14,000 acres in size (Table 3-36). On a landscape level, the watershed can be described as a relatively flat floodplain bench draining to Virginia Lake, that quickly increases in elevation and forms a steep-sided, u-shaped valley as it extends to the northeast. The drainage density of mapped Class I-III streams in the Porterfield Creek drainage is 1.52 stream miles per square mile, which is the second lowest among all of the review watersheds (Table 3-37). In comparison to other study area watersheds, the Porterfield Creek drainage contains the highest percentage of soils/land type units that have high to extreme landslide potential (i.e., MMI 3 and MMI 4) (Table 3-36).

Limited human disturbance has occurred within the Porterfield Creek drainage. The only known disturbance activity within the drainage has been a limited amount of exploration mining. No timber harvest, road construction, or channel modifications are known to have occurred within the drainage.

The Porterfield Creek drainage contains 11.5 miles of fish-bearing waters (i.e., Class I and II), which is more than any other watershed in the Project Area (Table 3-37). Upstream passage for anadromous species is blocked at approximately River Mile 3.3 by a series of natural bedrock falls and cascades; above these falls increased channel gradient and coarse channel substrate greatly reduce the quality of fish habitat (Figure 3-22). The watershed as a whole supports a diverse population of managed fish species including: coho, sockeye, and pink salmon, cutthroat trout, and Dolly Varden char (Dennis Reed, personal communication, USDA Forest Service, Fisheries Biologist, Wrangell Ranger District, 1999). A 1978 ADF&G habitat survey reported water temperature, substrate size, riffle to pool ratio, pool depth, and instream cover all to be within acceptable ranges for providing "good" spawning and rearing habitat in the lower 1.5 miles of Porterfield Creek (see Gagner, 1999).

## ***Glacier Creek Drainage (A07C)***

The Glacier Creek drainage is the second largest watershed in the Project Area encompassing approximately 9,022 acres (14.1 square miles) and draining much of the central and eastern portions of the study area. Glacier Creek, along with Porterfield Creek, is one of the two major inflow contributors to Virginia Lake. Stream density of Class I-III streams in Glacier Creek drainage is just slightly higher than that found in Porterfield Creek drainage at 1.74 miles per square mile. Similar to the Porterfield Creek drainage, the Glacier Creek drainage contains a relatively high percentage of MMI 4 (31.3 percent) and MMI 3 (7.6 percent) soils/land types which have high to very high landslide potential (Table 3-36).

No timber harvest, road construction, or channel modifications activities are known to have occurred within the Glacier Creek drainage. Limited exploration mining has occurred within the drainage, but there are no visible signs of impact from these activities to watershed or fisheries resources in the drainage (see Landau, 1999a, for further discussion).

The Glacier Creek drainage contains 10.5 miles of fish bearing waters (i.e., Class I and II), which is second only to the Porterfield Creek drainage in the Project Area (Table 3-37). Upstream fish passage within mainstem Glacier Creek is blocked at approximately River Mile 3.3 by a large (approximately 100 vertical feet) natural bedrock





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Table 3-36.

**Comparison of Drainage Area Size and Acres of MMI 3 and 4 Soil/Land Type for the Evaluation Watersheds in the Madan Project Area**

Watershed Name	Drainage Area		MMI 3 and 4 Soil/Land Type		
	(acres)	(sq. miles)	MMI 3	MMI 4	Percent MMI 4
Porterfield Creek (A07B)	13,959	21.8	1,054	4,873	35
Glacier Creek (A07C)	9,022	14.1	674	2,755	31
Virginia Lake (A07D)	2,718	4.2	411	532	20
Gypsy Creek (A08A)	2,812	4.4	314	76	3
Jenkins Cove (AA6A)	905	1.4	90	0	0
Madan Bay (A09A, AA7A)	1,050	1.6	202	196	19
Moose Creek (A14A)	5,050	7.9	852	1,358	27
<b>Total</b>	<b>35,516</b>	<b>55.5</b>	<b>3,597</b>	<b>9,790</b>	<b>28</b>

Table 3-37.

**Stream Classes I-III Miles and Density for Each of the Review Watersheds in the Madan Project Area<sup>1/</sup>**

Watershed Name	Stream Length (miles)				Density (mi./sq. mi.) <sup>1/</sup>
	Class I	Class II	Class III	Total	
Porterfield Creek (A07B)	7.8	3.7	21.6	33.2	1.52
Glacier Creek (A07C)	4.9	5.6	13.6	24.0	1.70
Virginia Lake (A07D)	0.6	0.6	10.5	11.7	2.80
Gypsy Creek (A08A)	0.5	4.0	4.5	9.1	2.10
Jenkins Cove (AA6A)	0.0	1.3	1.2	2.4	1.70
Madan Bay (A09A, AA7A)	0.2	0.0	3.5	3.4	2.40
Moose Creek (A14A)	0.9	2.4	7.0	10.3	1.30
<b>Total</b>	<b>14.9</b>	<b>17.6</b>	<b>61.9</b>	<b>94.1</b>	<b>Avg. = 1.70</b>

1/ Note that there are many more miles of Class IV streams (which are not as well-mapped) in the Project Area.

falls (Figure 3-22) (ADF&G, 1978). The Glacier Creek watershed supports managed fish species including: sockeye and cutthroat trout (Dennis Reed, personal communication). Spawner surveys conducted by the Forest Service since 1989 have documented extensive use of lower (approximately 1,000 feet) Glacier Creek by spawning sockeye. Project surveys in 1997 of lower Glacier Creek reported substrate size, habitat composition, water depth, and instream cover all to be within acceptable ranges for providing "good" spawning and rearing habitat in the lower 0.25 mile of Glacier Creek (Gagner, 1999).

#### **Virginia Lake and Mill Creek (A07D)**

The Virginia Lake and Mill Creek drainage is the fifth largest of the eight review watersheds in the Project Area encompassing approximately 2,718 acres (Table 3-36). Virginia Lake itself is the dominant feature within the watershed with a surface area of 636 acres. The lake contains one small (2.5-acre) forested island located in the

southeastern corner near the Glacier Creek inlet (Figure 3-22). The Virginia Lake drainage receives all stream flow discharge from the Porterfield and Glacier Creek watersheds. Water exits Virginia Lake via Mill Creek, at the western end of the lake, and flows for approximately 0.6 miles before entering saltwater in Eastern Passage. Class I-III stream density in the Virginia Lake drainage is the highest of all review watersheds at 2.83 miles per square mile (Table 3-37). Steep valley sideslopes and unconsolidated soils result in 31 percent of the watershed area being classified as MMI 3 or MMI 4 soil/land type (Table 3-36).

As with most of the Project Area, very little negative ecosystem disturbance has affected the natural systems within the Virginia Lake and Mill Creek drainage. Historically, timber harvest in the watershed has been limited to hand logging of nearshore areas along the Eastern Passage and within the lowermost reaches of Mill Creek. Forest regrowth has replaced harvested trees leaving very little trace of past management activities. No roads are currently present within the watershed.

Virginia Lake is a moderately sized pristine lake known for its scenic beauty and recreational value. Results of limnological investigations of Virginia Lake in 1986 indicated that the combination of good summertime water quality, adequate food sources, and sufficient spawning area justified the enhancement of the small sockeye fishery that the lake supported at that time (Northern Southeast Regional Aquaculture Association [NSRAA], 1986). Subsequent cooperative fishery enhancement activities undertaken in the drainage have included: construction of a combination steeppass and pool-and-weir fishway in 1988 to increase fish passage into Virginia Lake; sockeye fry releases (1989-1995); lake enrichment (1991-1996, 1998-present); annual limnological and sockeye survival monitoring; and annual adult escapement surveys. Although adult sockeye escapement has shown a significant improvement from pre-enhancement estimates in some years, adult returns remain well below the estimated 20,000 to 30,000 sockeye originally expected from the enhancement measures (ADF&G, 1997). Recent update of the sockeye production model now estimates the potential productivity of Virginia Lake at 10,000 to 17,000 sockeye (Heinl and Zadina, 2001). As lake enrichment continues, different methodologies of sockeye bioenhancement are being investigated. Virginia Lake is also regionally recognized as providing one of the top recreational cutthroat trout fisheries in Southeast Alaska and there is a locally important subsistence sockeye fishery at the mouth of Mill Creek.

## ***Gypsy Creek (A08A)***

The Gypsy Creek drainage is the fourth largest watershed in the Project Area encompassing approximately 2,812 acres draining much of the west-central portion of the study area (Table 3-36). Class I-III stream density in Gypsy Creek drainage is the second highest of the review watersheds at 2.48 miles per square mile (Table 3-37). The Gypsy Creek drainage contains one of the lowest percentages of MMI 3 and MMI 4 soil/land types with 11.2 percent and 2.7 percent, respectively (Table 3-36).

Similar to the Virginia Lake watershed, historical timber harvest in the watershed has been limited to hand logging of nearshore areas along the Eastern Passage and within the lowermost reaches of the drainage. Forest regrowth has replaced harvested trees leaving very little trace of past management activities.

The Gypsy Creek drainage contains approximately 4.25 miles of fish-bearing waters, which is the third highest of all watersheds reviewed in the Project Area (Table 3-37). Upstream fish passage within mainstem Gypsy Creek is blocked at approximately River Mile 0.25 by a large (approximately 45 vertical feet) natural bedrock falls (Figure 3-22). Pedestrian surveys completed during the 1997 field investigation qualitatively rated lower



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Gypsy Creek as “good” for resident trout; however, the number of cascades and small falls severely limits fish movement within the lower reach (Gagner, 1999).

#### ***Jenkins Creek (AA6A)***

The Jenkins Creek drainage is the smallest (the two watersheds that comprise Madan Bay are individually smaller than the Jenkins Creek watershed, but have a larger composite drainage area) of the seven watersheds reviewed in the Madan Project Area encompassing approximately 905 acres (Table 3-36). The density of Class I-III streams in Jenkins Creek drainage is similar to the Gypsy Creek watersheds at 2.23 miles per square mile (Table 3-37). The Jenkins Creek drainage contains no MMI 4 soil/land type and only about 10 percent of the total area classified as MMI 3 soil/land type (Table 3-36).

The current condition of watershed and fisheries resources found within the Jenkins Creek drainage are representative of an undisturbed/unmanaged ecological system. There has been no known timber harvest, road construction, or mining activity within the Jenkins Creek drainage.

The Jenkins Creek drainage contains approximately 1.3 miles of fish bearing waters (Table 3-37, Figure 3-22). Approximately 300 to 400 feet upstream from the mouth of Jenkins Creek, anadromous fish passage is blocked by a natural bedrock falls (approximately 12 feet vertical height) (Figure 3-22). Resident fish, assumed to be cutthroat trout and/or Dolly Varden char, were observed in the MM channel type section of Jenkins Creek. No anadromous or resident fish were observed during electrofishing surveys completed in 1998 below the lowermost falls on Jenkins Creek. Stream channel substrate size, water depth, instream cover, and habitat composition appear to be sufficient to provide “average” to “good” spawning and rearing habitat for resident fish in the middle portion of Jenkins Creek (Gagner, 1998).



#### ***Madan Bay (A09A, AA7A)***

The Madan Bay drainage, the second smallest of the seven watersheds reviewed, encompasses approximately 1,050 acres (Table 3-36). The Class I-III stream density in the Madan Bay drainage is the highest of all review watersheds at 2.40 miles per square mile (Table 3-37). The percent of the watershed classified as MMI 3 and MMI 4 soil/land type is 27 percent, respectively (Table 3-36).

Similar to the Jenkins Creek watershed, current Madan Bay watershed and fisheries resource condition is representative of an undisturbed/unmanaged ecological system. There has been no known timber harvest, road construction, or mining activity within the Madan Bay watershed.

The Madan Bay drainage contains only 0.2 mile of fish-bearing waters (Class I and II) (Table 3-37). Steep channel gradient and lack of suitable habitat has restricted the distribution of resident and anadromous fish species in the watershed to the lowermost reach of drainage basin A09A.



## ***Moose Creek (A14A)***

The Moose Creek drainage is the third largest watershed in the Project Area encompassing approximately 5,050 acres and draining much of the south and central portion of the study area. Mapped Class I-III stream density in Moose Creek drainage is the lowest among all of the review watersheds at 1.3 miles per square mile (Table 3-37). The Moose Creek drainage contains the highest composite percentage of MMI 3 (17 percent) and MMI 4 (27 percent) soils/land types with approximately 44 percent of the watershed area classified as having high to extreme landslide potential (Table 3-36).

Past land management activities within the Moose Creek drainage have been restricted to the clearcut harvest of approximately a 30-acre area adjacent to the lower 0.25-mile section of Moose Creek in 1960 (ADF&G, 1978). Although extensive regrowth of the harvested area has occurred, the primary regeneration species is alder with a much smaller fraction of spruce than that of surrounding, unharvested areas (Gagner, 1999). No roads or active mining claims are currently present within the watershed.

The Moose Creek drainage contains approximately 3.3 miles of fish bearing waters (i.e., Class I and II), which is the third highest of all watersheds reviewed in the Project Area (Table 3-37). Upstream fish passage within mainstem Moose Creek is blocked near River Mile 0.8 by a large (approximately 35 vertical feet) natural bedrock falls (Figure 3-22).

Pedestrian surveys completed in 1978 by ADF&G rated the lowermost section of Moose Creek as "good" for salmonid habitat with sufficient spawning areas and appropriately sized spawning gravel substrate (ADF&G, 1978). Salmonid fish habitat in upper Moose Creek is characterized as "poor" to "average" due to coarse channel substrate, lack of instream cover, and a low pool to riffle ratio (Gagner, 1997). Adult escapement surveys of Moose Creek have been conducted sporadically since 1976 by ADF&G. Escapement estimates for Moose Creek have ranged from a low of zero pink salmon in 1976 to a high of 1,400 pink salmon in 1979 (ADF&G).

## ***General Watershed and Fish Resource Effects***

In general terms, activities associated with the management of forest resources may affect the amount of geomorphic products produced and the timing of delivery to the aquatic environment (i.e., increased erosion, changes in water available for runoff, altering wood loading and nutrient cycling to streams, or altering stream temperature by removing shade). Additionally, the movement or flow of both aquatic organisms (e.g., fish, invertebrates, amphibians) and terrestrial inputs (e.g., sediment, large and small woody debris, and particulate matter) can be restricted or completely blocked by improperly designed or constructed stream crossing structures. Since each watershed possesses distinct environmental conditions, resource characteristics, and sensitivities to disturbance, analysis of management activities relies on defining the proposed activities within each watershed and assessing potential impacts to existing resource conditions.

Changes in the quantity and timing of geomorphic inputs, if large enough, may express themselves in stream channels in observable/measurable ways. In turn, these changes in the physical characteristics of streams as they respond to sediment, water, wood, and energy may have negative impacts on the biological communities they support.

Numerous design measures have been incorporated into each of the action alternatives to avoid or reduce possible effects on the fishery and watershed resources. Specific examples include:

- To protect the highly valued fishery in the Virginia Lake drainage, the project completely avoids disturbance in the Porterfield Creek drainage and the proposed

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OGR modification would provide protection for nearly all of the Glacier Creek and Virginia Lake drainages.

- Significant changes have been made to proposed road locations to avoid areas with numerous instability features or areas requiring large numbers of Class III, v-notch stream crossings. Additionally, no Class I stream crossings are proposed and six or fewer Class II crossings are proposed under each of the action alternatives.
- Substantial use of helicopter logging techniques would be used to reduce ground disturbance and significantly reduce the number of required road miles and stream crossings in all alternatives. Development of two alternatives dominated by helicopter logging.

#### *Hydrologic Effects*

In general, effects to hydrologic processes in forested environments are directly related to the percentage of the watershed area that has been harvested or roaded. The strength of this cause-and-effect relationship diminishes when clearcut harvest prescriptions are replaced with patch or small group cuts due to increased utilization of available moisture by surrounding vegetation (Beschta et al., 1995). Research on the hydrologic effects of road construction and timber harvest has presented several thresholds or "rules-of-thumb" for predicting a level of disturbance that may result in changes to the hydrologic system. Spencer et al. (1996) presented two such thresholds in their summary of studies of the hydrologic effects of forest management. They reported altered stream hydrology when roads constituted 4 percent or greater of the watershed area. The other threshold was derived from a review of over 90 watershed studies that reported increased water yield generally occurring after 20 percent to 30 percent of a watershed area has been harvested. Separate research conducted in Southeast Alaska by Bartos (1989) suggested that increases in base stream flow were observed after approximately 35 percent of a watershed had been logged.

When compared to the threshold values presented above, the anticipated hydrologic effects associated with timber harvest and road construction within the Project Area would be minimal under all of the action alternatives. Increased use of high retention (>50 percent) harvest prescriptions and limited use of traditional clearcut logging techniques have resulted in relatively low percentages of disturbance to any one watershed under all of the action alternatives. Alternative 2 proposes the largest amount of harvest with almost 3 percent of the total review watershed area affected by timber harvest. As a percentage of total watershed area, the Jenkins Creek drainage would experience the highest level of harvest under all of the action alternatives, with the highest level occurring under Alternatives 3 and 4 (Table 3-38). The Madan Bay and Gypsy Creek watersheds receive the second and third highest percentage of area affected under most alternatives. Even though Alternatives 2 and 4 propose a similar level of timber harvest, Alternative 2 requires construction of significantly more road miles and affects most of the major watersheds in the Madan Project Area (Tables 3-38 and 3-39). Likewise, Alternative 5 proposes harvest on 417 fewer acres than Alternative 4, but requires the construction of approximately 8 miles of additional road. No timber harvest or road construction activities are proposed under any of the proposed alternatives for the Porterfield Creek watershed. Furthermore, less than 1 percent of the Glacier Creek watershed is proposed for timber harvest requiring less than 0.1 mile of road construction. Although both of these watersheds remain relatively undisturbed under this proposed action, future management actions could occur in these areas.



Table 3-38.

**Number of Acres and Percent of Evaluation Watersheds Proposed for Harvest under Each of the Action Alternatives**

		Number of Acres Harvested by Minimum Retention Level					% of Total Watershed Area Harvested by Minimum Retention Level <sup>1/</sup>				
Watershed	Acres	10%	50%	60%	70%	Total	10%	50%	60%	70%	Total
Alternative 2											
Porterfield Creek	13,959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Glacier Creek	9,022	35.0	0.0	0.0	95.1	130.1	0.4	0.0	0.0	0.3	0.7
Virginia Lake	2,718	29.5	0.0	0.0	215.4	244.9	1.1	0.0	0.0	2.4	3.5
Gypsy Creek	2,812	241.6	0.0	0.0	145.5	387.1	8.6	0.0	0.0	1.6	10.1
Jenkins Creek	905	8.2	0.0	0.0	316.5	324.6	0.9	0.0	0.0	10.5	11.4
Madan Bay	1,050	46.1	0.0	0.0	175.8	221.9	4.4	0.0	0.0	5.0	9.4
Moose Creek	5,050	236.0	0.0	264.4	6.6	507.0	4.7	0.0	2.1	0.0	6.8
Total	35,516	596.4	0.0	264.4	954.9	1,815.6	1.7	0.0	0.3	0.8	2.8
Alternative 3											
Porterfield Creek	13,959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Glacier Creek	9,022	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virginia Lake	2,718	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsy Creek	2,812	44.2	0.0	0.0	37.5	81.6	1.6	0.0	0.0	0.4	2.0
Jenkins Creek	905	4.0	0.0	0.0	407.2	411.1	0.4	0.0	0.0	13.5	13.9
Madan Bay	1,050	46.1	0.0	0.0	275.5	321.6	4.4	0.0	0.0	7.9	12.3
Moose Creek	5,050	156.7	0.0	264.4	6.6	427.6	3.1	0.0	2.1	0.0	5.2
Total	35,516	251.0	0.0	264.4	726.8	1,241.9	0.7	0.0	0.3	0.6	1.6
Alternative 4											
Porterfield Creek	13,959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Glacier Creek	9,022	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virginia Lake	2,718	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsy Creek	2,812	0.0	0.0	0.0	37.5	37.5	0.0	0.0	0.0	0.4	0.4
Jenkins Creek	905	0.0	4.0	0.0	422.0	426.0	0.0	0.2	0.0	14.0	14.2
Madan Bay	1,050	0.0	46.1	0.0	275.5	321.6	0.0	2.2	0.0	7.9	10.1
Moose Creek	5,050	240.2	0.0	264.4	0.0	504.6	4.8	0.0	2.1	0.0	6.9
Total	35,516	240.2	50.1	264.4	735.0	1,289.7	0.7	0.1	0.3	0.6	1.7
Alternative 5											
Porterfield Creek	13,959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Glacier Creek	9,022	35.0	0.0	0.0	95.1	130.1	0.4	0.0	0.0	0.3	0.7
Virginia Lake	2,718	29.5	0.0	0.0	215.4	244.9	1.1	0.0	0.0	2.4	3.5
Gypsy Creek	2,812	241.6	0.0	0.0	0.5	242.1	8.6	0.0	0.0	0.0	8.6
Jenkins Creek	905	8.2	0.0	0.0	309.6	317.8	0.9	0.0	0.0	10.3	11.2
Madan Bay	1,050	46.1	0.0	0.0	175.8	221.9	4.4	0.0	0.0	5.0	9.4
Moose Creek	5,050	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	35,516	360.4	0.0	0.0	796.4	1,156.8	1.0	0.0	0.0	0.7	1.7

1/ Percentages are calculated after taking retention level into account, except areas with 10% retention level are assumed to be 100% harvested.



### 3 Affected Environment and Environmental Consequences

Table 3-39.

Miles of Proposed Road and Percent Roaded Area for each of the Action Alternatives

Watershed	Total Acres	Alternative 2		Alternative 3		Alternative 4		Alternative 5	
		Road Miles	% Roaded Area <sup>1/</sup>	Road Miles	% Roaded Area	Road Miles	% Roaded Area	Road Miles	% Roaded Area
Porterfield Creek	13,959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Glacier Creek	9,022	<0.1	0.0	0.0	0.0	0.0	0.0	<0.1	0.0
Virginia Lake	2,718	1.1	0.2	<0.1	0.0	0.0	0.0	1.1	0.2
Gypsy Creek	2,812	5.2	1.1	0.5	0.1	0.0	0.0	5.2	1.1
Jenkins Creek	904.6	1.7	1.1	0.6	0.4	0.0	0.0	1.7	1.1
Madan Bay	1,050	1.5	0.9	1.5	0.9	0.0	0.0	1.5	0.9
Moose Creek	5,050	5.7	0.7	2.4	0.3	5.5	0.7	0.0	0.0
Other Areas	5,068	5.9	0.6	3.8	0.5	1.1	0.1	5.1	0.6
<b>Total</b>	<b>40,584</b>	<b>21.3</b>	<b>0.3</b>	<b>9.0</b>	<b>0.1</b>	<b>6.7</b>	<b>0.1</b>	<b>14.7</b>	<b>0.2</b>

<sup>1/</sup>Percent roaded area calculated by assuming an average 50-foot-wide disturbance area multiplied by the miles of proposed road and then divided by the total watershed acres.

#### Sediment Effects

Management-related sediment enters streams primarily through surface erosion from roads and disturbed areas, and mass wasting. The likelihood that sediment will reach the stream system decreases with increasing distance between harvest activities and stream channels. Furthermore, reducing the number of stream crossings reduces the likelihood that management produced sediment will reach stream systems. Since all Class I and II streams will receive a minimum of a 100-foot no-cut riparian buffer, only the miles of Class III streams within or adjacent to harvest units (defined as within 100 feet of a harvest unit) will be used for comparison among the four action alternatives. Following guidelines described in the Forest Plan (1997), all Class III stream channels identified during field surveys received no-programmed harvest buffers extending from the streambank to the top of the first topographic break along the streambank sideslope. Although Alternative 2 has the greatest number of miles of Class III stream miles within or adjacent to harvest units, all four of the action alternatives have relatively limited number of Class III stream miles within or adjacent to harvest units (Table 3-40). The combination of low stream density (Table 3-37) and the limited miles of proposed road under all of the action alternatives have resulted in a limited number of road crossings. Alternatives 2 and 5 contain the largest number of proposed Class II and III stream crossings with 13 and 10, respectively (Table 3-41). Alternative 4 contains the fewest proposed road miles and subsequently, the fewest proposed stream crossings.

Table 3-40.

**Number of Miles of Class III Streams Within or Adjacent to Proposed Harvest Units for the Action Alternatives by Review Watershed**

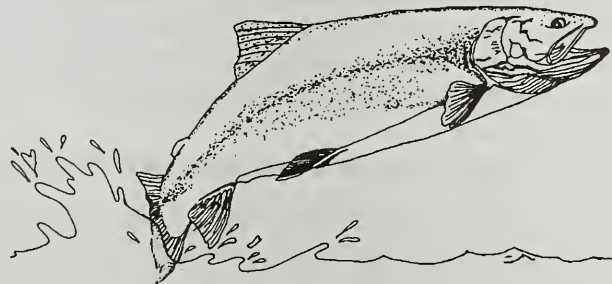
Watershed	Alternative				Watershed Total Class III Stream Miles
	2	3	4	5	
Porterfield Creek	0.0	0.0	0.0	0.0	21.6
Glacier Creek	0.0	0.0	0.0	0.0	13.6
Virginia Lake	0.9	0.0	0.0	0.9	10.5
Gypsy Creek	1.4	0.5	0.1	0.9	4.5
Jenkins Creek	0.0	0.8	0.8	0.0	1.2
Madan Bay	1.1	1.7	1.7	1.1	3.5
Moose Creek	2.3	2.3	2.3	0.0	7.0
<b>Total</b>	<b>5.7</b>	<b>5.3</b>	<b>4.9</b>	<b>2.9</b>	<b>61.9</b>

Table 3-41.

**Number of Stream Crossings by Stream Class for each of the Action Alternatives**

Watershed	Alternative 2			Alternative 3			Alternative 4			Alternative 5		
	Stream Class			Stream Class			Stream Class			Stream Class		
	II	III	Total	II	III	Total	II	III	Total	II	III	Total
Porterfield Creek	--	--	0	--	--	0	--	--	0	--	--	0
Glacier Creek	--	--	0	--	--	0	--	--	0	--	--	0
Virginia Lake	--	1	1	--	--	0	--	--	0	--	1	1
Gypsy Creek	4	2	6	1	--	1	--	--	0	4	2	6
Jenkins Creek	1	--	1	1	--	1	--	--	0	1	--	1
Madan Bay	--	--	--	--	--	0	--	--	0	--	--	0
Moose Creek	--	3	3	--	3	3	--	3	3	--	--	0
Other areas	1	1	2	1	1	2	--	--	0	1	1	2
<b>Total</b>	<b>6</b>	<b>7</b>	<b>13</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>10</b>

Note- There are no Class I stream crossings proposed for the Madan project under any alternative.



### **3 Affected Environment and Environmental Consequences**

#### ***Effects on Water Temperature***

Mandatory no-cut buffers established on all Class I – III streams will significantly reduce the likelihood of temperature related effects to streams within the Project Area. Proposed timber harvest units located adjacent to Class I and II streams provide a minimum of a 100-foot no-cut buffer between the unit and the stream (generally the buffers are larger and are based on the type of stream channel present, as defined by the Forest Plan). Although Class III streams generally receive a narrower no-cut buffer, the relatively narrow channel width associated with these streams require a corresponding smaller buffer area to provide streamside shade. There are currently no mandatory buffers provided on Class IV streams. Although Alternative 2 proposes the largest amount of timber harvest, and would therefore pose the greatest risk of increased stream temperature, there would be no anticipated significant effect on water temperature within study area streams under any of the action alternatives.

#### ***Effects on Large Woody Debris***

As was the case for predicted water temperature impacts, the mandatory no-cut buffers established along all Class I – III streams will significantly reduce the likelihood of reduction in the short- or long-term recruitment of large woody debris (LWD) to streams within the Project Area. Blowdown of stream buffers may increase short-term and reduce long-term recruitment, but it is not expected to be a major factor in Project Area buffers. Although Alternative 2 proposes the largest amount of timber harvest, and would therefore pose the greatest risk of reducing LWD recruitment, there would be no anticipated significant impact to LWD recruitment within study area streams under any of the action alternatives.

#### ***Physical Migration Barriers***

Currently there are no management-related barriers to fish migration within the Project Area. Management activities proposed under the action alternatives have the potential to affect habitat access for resident salmonids through the construction of culvert stream crossings. However, no stream crossings are proposed for stream sections containing anadromous salmonids. Alternatives 2 and 5 contain the most stream crossings located on fish-bearing streams with six proposed for each alternative (Table 3-41). Road and stream crossing construction under Alternative 4 would have the lowest risk of creating obstacles to fish migration as no stream crossings are proposed for fish bearing waters. All Class II stream crossings will be designed for fish passage. It is recognized that many existing culverts on Class II streams on the Tongass National Forest do not meet current fish passage standards. With this knowledge, recently acquired knowledge of fish passage requirements for resident fish, and an increased emphasis on providing fish passage for resident fish, passage will be provided at all culverts on resident fish streams.

#### ***Effects on Essential Fish Habitat***

Section 305 (b)(1)(A and B) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq.), mandates the establishment of new requirements for Essential Fish Habitat (EFH) description and to require federal agencies to consult with the National Marine Fisheries Service (NMFS) on activities that may adversely affect EFH. As defined in section 3(10) of the Magnuson-Stevens Act, “EFH is those waters and substrate necessary to salmon for spawning, breeding, feeding, or growth to maturity.” For the purpose of the document, “waters” are considered all Class I streams and lakes, marine waters, and intertidal zones of the Madan study area. On August 25, 2000 (after the Madan Draft EIS was published) a policy was established which required the Forest Service to seek consultation from the National



Marine Fisheries Service. Included in this consultation policy is the need for NMFS to concur with findings. Even though this policy was issued after the Madan Draft EIS was published, it was satisfied anyway.

The application of Forest-wide standards, guidelines, and BMPs developed to meet water quality standards and for the protection and enhancement of watershed processes and fish habitat are believed to be sufficient to protect EFH. In addition, no road crossings of Class I streams are proposed and harvest activities have been limited within stream drainages that support salmon populations. The LTF sites meet siting guidelines for protecting anadromous fish streams and sensitive habitats. The USFWS found both sites suitable for development (Appendix D). The Draft EIS found that no alternative was likely to adversely affect EFH. The Draft EIS was mailed to NMFS as part of the consultation process. Additionally, the NMFS was contacted by telephone.

### ***Effects on Floodplains and Riparian Areas***

The identification and protection of floodplain and riparian areas is critical to maintaining properly functioning stream systems. Floodplains and riparian areas help to moderate peak flows, recharge streams during low flow periods, allow for natural channel migration, intercept sediment, and provide shade, LWD recruitment, organic nutrients, and channel stability. Tongass National Forest streams have been classified and mapped according to stream process group, which serve as the basis for delineating riparian management areas and defining appropriate streamside buffers. The process groups reflect physical differences in stream channels and stream processes (USDA, 1992). Table 3-42 shows the distribution of stream process groups in each of the major watersheds. Although each channel process group serves a critical role in the development and maintenance of fish habitat, the floodplain, estuarine, alluvial fan, and palustrine stream process groups represent the most critical and sensitive riparian areas in the Project Area (see Fisheries Resource Report, Gagner, 1999; Paustian et al., 1992 for further discussion of channel process groups).

Direct effects on floodplains and riparian areas may result from vegetation and ground disturbance in these areas. Each of the action alternatives provides a high level of riparian and floodplain protection through both mandatory mitigation measures and project-specific design considerations. Riparian management areas associated with Class I, II, and III streams in the vicinity of proposed roads and units were verified by field crews and in many cases, unit boundaries and road locations were changed to protect riparian areas (see Gagner, 1999). For example, a road system proposed for the eastside of Moose Creek (A14A) was considered early in the project, but was dropped because the only feasible location for the road was through an area with numerous instability features (old slides and slumps) and which would have required a large number of Class III, v-notch stream crossings. Even as a temporary road with all drainage structures removed, there was a concern that mitigation measures to maintain floodplain function, channel stability, and fish habitat would have a high risk of failure, resulting in chronic long-term impact to these resources. The Moose Creek road system was, therefore, moved to the opposite side of the stream to an area with significantly fewer instability features, requiring fewer Class III stream crossings, and crossings over Moose Creek were totally avoided.

### 3 Affected Environment and Environmental Consequences

None of the alternatives propose modifications to the riparian standards and guidelines described in the Forest Plan. The width of the riparian management areas (no-harvest buffers) vary by stream class and channel sideslope characteristics. Special care was taken to ensure that no proposed harvest units were located within or adjacent to areas classified as floodplain channel types. Other protection/mitigation measures included placing complete sideslope buffers along all large v-notch streams (Class III, HC streams) and directional felling and partial suspension of all Class IV stream channels.

Table 3-42.

#### Stream Miles by Channel Process Group for Each of the Review Watersheds

Watershed Name	Stream Process Group (Miles)								
	FP	GO	AF	LC	MM	MC	HC	PA	ES
Porterfield Creek	4.8	0.6	0.4	1.7	0.7	1.1	23.2	0.7	0.0
Glacier Creek	5.5	2.5	1.6	2.0	0.6	0.8	9.9	1.1	0.0
Virginia Lake	0.0	0.0	0.2	0.6	0.0	0.0	10.9	0.0	0.0
Gypsy Creek	0.3	0.0	0.6	0.0	1.2	1.2	5.9	0.0	0.0
Jenkins Creek	0.0	0.0	0.0	0.0	0.6	0.0	1.9	0.0	0.0
Madan Bay	0.5	0.0	0.2	0.0	0.0	0.0	2.7	0.0	0.0
Moose Creek	0.4	0.0	0.5	0.0	1.0	1.4	7.0	0.0	<0.1
<b>Totals</b>	<b>11.5</b>	<b>3.1</b>	<b>3.5</b>	<b>4.3</b>	<b>4.1</b>	<b>4.5</b>	<b>61.5</b>	<b>1.8</b>	<b>&lt;0.1</b>
FP	Flood Plain Process Group								
GO	Glacial Outwash Process Group								
AF	Alluvial Fan Process Group								
LC	Large Contained Process Group								
MM	Moderate Gradient Mixed Control Process Group								
MC	Moderate Gradient Contained Process Group								
HC	High Gradient Contained Process Group								
PA	Palustrine Process Group								
ES	Estuarine Process Group								

#### Cumulative Effects

Disturbances within a watershed caused by management activities can be individually quite small, but may collectively result in larger basin-wide disturbances or cumulative effects. As these disturbances accumulate, they can interact with each other in various combinations over a long period. Cumulative effects may lead to increased erosion, streamflow, and subsequent channel degradation. The degree of the effect is dependent upon the frequency and magnitude of individual impacts plus the rate of recovery by the watershed. Some of the specific factors that could influence cumulative effects to watershed and fisheries resources are the size of harvest and its physical relationship to streams; the length of road, its characteristics, traffic level, and the number of streams crossed; the effectiveness of best management practices implemented; and basin hydrology and channel morphology.

The Project Area has experienced very little past management activity, resulting in little negative change to watershed processes or fish habitat conditions. The only Madan project watersheds with reasonably foreseeable plans for future management are Gypsy Creek and adjacent watersheds, near the mouth of Mill Creek, where future logging on state lands could occur. No logging on state lands is currently proposed as part of this action or separately, and the amount of suitable timber on state lands within these watersheds that is likely to be logged is very small because of the low acreage involved and the recreation and visual constraints on harvest. Future harvest in 2007 and 2011 in the Crittenden Creek area on National Forest System lands would not affect Project Area watersheds; therefore, there are no anticipated cumulative effects (past management effects combined with present and reasonably foreseeable future effects) on current watershed or fish resources. The number of proposed harvest acres and road miles have



been presented, however, for each of the action alternatives for use in future evaluations of cumulative effects.

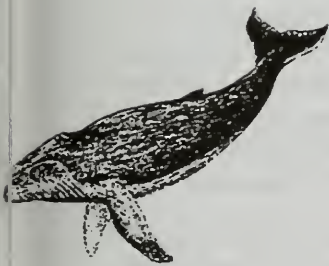
Over the next 50 to 100 years, harvest and road construction could take place over much of the Madan and Crittenden Project Areas, resulting in considerable additional road development and harvest. The LUDs in the area together with the Forest-wide standards and guidelines defined by the Forest Plan, should prevent significant cumulative watershed effects over the long term.

## Marine Resources

Estuaries and nearshore marine environments are among the most productive natural systems and are important nursery areas that provide food, refuge from predation, and valuable habitat for many species. The biota of coastal, Southeast Alaska ecosystems includes a wide variety of plants, birds, fish, mammals, and invertebrate species. The ecological health of each coastal ecosystem is controlled by oceanic and terrestrial factors that influence the conditions of its waters (Clark, 1977).

The deepwater habitat comprising most of the Eastern Passage and Blake Channel supports a wide array of marine species. Target species for subsistence, commercial, and marine sport fishing include Dungeness and tanner crab; pink, spot, sidestripe, and coonstripe shrimp; halibut; and chinook, coho, and sockeye salmon. Seals, orcas, humpback whales, and Pacific white-sided dolphins have also been observed in this area. Commercial fishing, charter, and recreation boats are known to use the sheltered coves and bays adjacent to the Project Area for anchorages and staging areas for land-based activities.

Because of the steep topography of the Project Area shoreline, there has been very little development of estuarine habitat at the saltwater interface of Project Area streams. Most of the approximately 27 miles of convoluted shoreline is comprised of boulder- and bedrock-dominated intertidal and deepwater marine habitats. Underwater SCUBA surveys for LTF siting were conducted at six separate locations along Project Area shorelines. These surveys described the overall plant and animal species diversity to be low. Only one of the LTF sites studied (located on the eastside of Moose Creek along the north shore of Blake Channel) was found to have insufficient water depth to be acceptable as a LTF site. Another location (on the inside of Jenkins Cove) was found to have a lower degree of circulation than was desirable. Neither of these sites was selected and, at all other survey locations, water depth, bark and sediment flushing potential, and low plant and animal species diversity made the sites suitable locations for construction and operation of an LTF (USFWS, 1997).



## Environmental Effects

The processing, transport, and storage of logs along aquatic systems generates two distinct modes of disturbance: physical and chemical. Both modes create direct as well as indirect effects on nearshore aquatic habitat (Meehan, 1991). Potential physical disturbances resulting from log-handling operations (sorting and log watering) at proposed LTF and log landing sites include substrate disturbance in shallow water areas; deposition and dispersion of bark and wood debris; disruption of the water column; and reduction in wave action and light penetration. The magnitude and spatial extent of these disturbances differ among types and volumes of log handling activity, water depth, site morphology and substrate, species and age of logs handled, seasons, and prevailing currents and circulation patterns (Meehan, 1991).



### 3 Affected Environment and Environmental Consequences

The small amount of estuarine habitats (Table 3-42) and restriction of timber harvest within 1,000 feet of the beach fringe (intertidal area) significantly reduces the potential for impacts to nearshore and estuarine areas. Other potential marine impacts are minimized through the location and design of the LTFs, the use of log landing sites, establishing operating guidelines to control pollution and debris (Hansen et al., 1971), and avoiding the likelihood of conflicts with other marine users.

From observations made during underwater surveys of each of the proposed LTF sites, it was concluded that construction and operation of the proposed LTF sites would not have a significant negative effect on existing marine and estuarine plant and animal resources (see Madan Watershed and Fisheries Resource Report [Gagner, 1999] and Appendix D for further discussion). Although Alternative 4 contains the fewest proposed road miles, the lack of proposed roads for log transportation requires the use of two barge sites and the construction of two LTF sites. It should be noted that impacts to marine resources from the operation of barge sites are generally considered to be lower than those associated with LTF sites (Meehan, 1991). Both Alternatives 2 and 3 propose the construction and operation of two LTF sites. No barge sites are proposed for Alternatives 2, 3, or 5 (Table 3-43).

Table 3-43.  
**Number of Log Transfer Facilities and Barge Sites Proposed for Each Action Alternative**

Action Alternative	LTFs	Barge Sites
2	Two	None
3	Two	None
4	Two	Two
5	One	None

### Wetlands

Wetlands are an active interface between terrestrial and aquatic components of a landscape and are defined by the U.S. Army Corps of Engineers (Corps) as "those areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (40 CFR 230.41 (a) (1)). This definition includes forested swamps, marshes, bogs, and other similar areas.

For federal regulatory purposes, wetlands are considered a subclass of Special Aquatic Sites (40 CFR Section 230.3) and have been deemed Waters of The United States (33 CFR 328.3). All Waters of the United States are subject to regulation through the Clean Water Act by the Corps and EPA. Sections 404 and 401 of the Clean Water Act were created specifically with the intent "to restore and maintain the chemical, physical and biological integrity of our Nation's waters." Additionally, Executive Order 11990 requires Federal agencies "to avoid....adverse impacts associated with the destruction or modification of wetlands...wherever there is a practicable alternative." To fulfill this requirement, under Section 404 of the Clean Water Act, the Corps has developed methodology to identify and delineate wetland sites. The procedure evaluates potential wetlands using a multi-parameter approach.

### Management and Related Issues

Exemptions to wetland regulations (Sections 404 and 401 of the Clean Water Act) are granted under Section 404(f)(1) and permit normal agricultural, ranching, and silvicultural activities, as well as maintenance of existing drains, farm ponds, and roads. The construction or maintenance of forest roads for silvicultural purposes is exempt from

regulation when such roads are constructed and maintained in accordance with BMPs. The BMPs “assure that flow and circulation patterns and chemical and biological characteristics of water of the United States are not impaired, that the reach of the waters of the United States is not reduced, and that any adverse effect on the aquatic environment will be otherwise minimized.” The proposed roads would be constructed and maintained in accordance with BMPs and therefore are exempt from a 404 permit.

Under the Forest Plan, wetlands are protected by their incorporation into non-development LUDs. Forest Plan forest-wide standards and guidelines for beach and estuary fringe and riparian areas provide additional protection to wetlands. The Forest Plan also includes forest-wide standards and guidelines specifically for wetlands, which establish a requirement to “avoid alteration of, or new construction on, wetlands, wherever there is a practicable, environmentally-preferred alternative, considering the functions and values of wetlands as well as other non-wetlands ecosystems in the Project Area” (Forest Plan, Chapter 4, “Wetlands”).

## ***Wetland Types within the Project Area***

Wetlands were identified in the Project Area using USFWS National Wetland Inventory (NWI) maps and field reconnaissance using the Corps’ three-parameter system described in the Corps Wetlands Delineation Manual (Corps, 1997). Following the field reconnaissance, the NWI GIS database was revised in order to generate wetland maps. These maps were used to quantify the acreage of wetlands in harvest units and along the proposed road segments.

The major types of wetlands in the Project Area are made up of both forested sites on poorly drained organic and mineral soils and nonforested, herbaceous plant-dominated sites on organic soils (muskegs or peatlands) (Table 3-44). Forested wetlands (palustrine forested) or wetland complexes dominated by trees make up approximately 10 percent of the Project Area. Muskegs (palustrine emergent) or muskeg-dominated complexes cover approximately 6 percent, and shrub wetlands (palustrine scrub-shrub) make up less than 1 percent of the Project Area. Small estuaries including muddy subtidal areas and riverine-associated wetlands each make up less than 1 percent of the Project Area. Deepwater habitats, including non-wetland areas (lakes and ponds), cover almost 2 percent of the Project Area (consisting mostly of Virginia Lake).

**Table 3-44.**  
**Wetland Areas within the Project Area**

Wetland Type	Wetland Acres	Percent of Project Area in Wetlands
Estuarine Emergent	17	0.0
Estuarine Unconsolidated Bottom	43	0.1
Lacustrine Unconsolidated Bottom	710	1.6
Palustrine Emergent	2,580	5.8
Palustrine Forested	4,240	9.6
Palustrine Scrub-shrub	219	0.5
Palustrine Unconsolidated Bottom	52	0.1
Palustrine Unconsolidated Shore	1	0.0
Riverine Unconsolidated Bottom	63	0.1
<b>Total</b>	<b>7,925</b>	<b>17.9</b>



### 3 Affected Environment and Environmental Consequences

The biological significance of a wetland is related to the value of its functions, and at least in part to the relative scarcity of the wetland type in the landscape. This is especially true in terms of biological diversity on the landscape scale. The relatively scarce fens, estuarine salt marshes and lakes are assumed to have a greater biological significance than the more common bogs and forested wetlands, which are widespread throughout the landscape.

Watersheds affected by project activities that contain the highest overall percentage of wetland habitats are generally found within the western portion of the Project Area and include Gypsy Creek (63 percent), Jenkins Cove (54 percent), the small coastal (000Z) watersheds (28 percent combined), and Virginia Lake (16 percent). Muskeg and sedge wetlands that provide valuable wildlife habitat were found associated with Porterfield Creek east of Virginia Lake, and within the Moose Creek watershed. Muskeg habitats are found interspersed with forested wetland and forested upland habitats throughout the Project Area.

**Salt or Marine Estuary Wetlands (Estuary):** These unique ecosystems are located at the interface of freshwater, terrestrial, and marine environments. They typically have poorly drained mineral soils that have higher pH values and nutrient contents than other wetland types. Vegetation in these areas is generally dominated by salt-tolerant sedge communities (*Carex* sp.). Estuaries support marine invertebrates such as clams and crabs, saltwater fish and anadromous fish. These species, in turn, support a wide variety of wildlife, including waterfowl, wading birds, bald eagles, small mammals, and bears.



**Forested Wetland (Palustrine Forested):** Wetlands dominated by trees and understories consisting of scrub shrubs, mosses, and sedges. Dominant tree species include yellow cedar (*Chamaecyparis nootkatensis*), mountain hemlock (*Tsuga mertensiana*), western hemlock (*Tsuga heterophylla*), and shore pine (*Pinus contorta*). Dominant understory shrubs and herbaceous species include huckleberries (*Vaccinium* sp.) and skunk cabbage (*Lysichiton americanum*). Soils are typically very poorly drained organic soils or poorly and very poorly drained mineral soils. Forested wetlands are typically interspersed with open moss muskegs or other types of wetlands as described below and can perform a variety of functions.

**Muskeg Wetlands (Palustrine Emergent):** Wetlands found from low to high elevation which produce and deposit organic matter at a greater rate than it is decomposed, leading to the formation of peat. Site factors that influence the hydrology of peatlands include shallow groundwater, poorly drained organic soils, topography, and vegetation (Brooks, 1992). These factors lead to a low level of microbial activity in the soil. Muskegs function as areas for recharge of groundwater and streams, and for deposition and storage of sediment and nutrients. Tree cover is less than 15 percent, consisting mainly of shore pine (*Pinus contorta*), mountain hemlock, and yellow cedar. Common shrubs include Labrador tea (*Ledum groenlandicum*), crowberry (*Empetrum nigrum*), and huckleberry. Common non-woody vegetation includes sphagnum mosses (*Sphagnum* sp.) or sedges (*Carex* sp.)

**Sedge Fen (Palustrine Emergent):** These wetland types are very similar to muskegs, but usually receive some drainage from surrounding mineral soil. These types of wetlands are generally slightly minerotrophic sites where peat is formed mainly from sedges or other plants. Fens can also function as recharge of groundwater and streams and because discharge at these sites remains relatively consistent throughout the summer; they can be particularly important for maintaining streams during dry periods.

**Alpine and Subalpine Wetlands (Palustrine/Riverine Emergent and Scrub-shrub):** Subalpine wetlands are bogs that occupy the sloping to steep summit of mountains. Dwarf shrubs, low sedges and various forbs typically dominate them. Trees are generally



scattered and stunted and include mountain hemlock, yellow cedar, and lesser amounts of shore pine. Soils are typically poorly and very poorly drained shallow organic soils over bedrock. Runoff from these sites can function as recharge for streams located within lower elevations of the landscape.

**Lacustrine (Ponds and Lakes) and Riverine (River and Streams) Associated wetlands:** These wetland types include deepwater habitats (lakes and ponds) and wetlands associated with the floodplains of river and stream systems. These areas may be partially non-vegetated (unconsolidated bottom), or may contain emergent, scrub-shrub or forested vegetation. Common emergent vegetation includes sedges and rushes. Scrub-shrub and forested vegetation is commonly made up of alder (*Alnus rubra* and *Alnus sitchensis*).

### **General Impact Mechanisms**

Timber harvest and associated activities such as road construction and use can affect wetland sites in a variety of ways. These can include altering disturbance regimes, altering successional rates and pathways, altering hydrologic regimes, and altering nutrient/chemical cycles.

Effects on wetlands resulting from the action alternatives can be divided into two categories: permanent loss (long term) and disturbance (short term). Road construction results in the filling of wetlands creating a permanent loss of wetland habitat. Timber harvest in wetlands would result in short-term vegetation changes.

For the purpose of wetland impact analysis within this section, harvest prescriptions were combined into two groups that include the area to be clearcut with reserves (10 percent minimum retention) and the area being selectively cut or patchcut (50 to 70 percent minimum retention). Descriptions of the individual harvest scenarios can be found in Chapter 2.

### **Alternative Comparison**

Alternative 1 is the No-Action Alternative and, therefore, would have no direct or indirect effect on wetland resources. Of the remaining alternatives, the greatest wetland area within harvest units occurs under Alternative 3 (424 acres) followed by Alternative 4 (419 acres), Alternative 2 (360 acres), and Alternative 5 (281 acres) (Table 3-45). Even though the greatest number of wetland acres would be affected under Alternatives 3 and 4, the amount affected totals 5 percent of the wetland acres in the Project Area (Table 3-45). Additionally, less than 0.5 acre of palustrine emergent wetlands (mostly muskeg) would be directly impacted by road construction under any of the alternatives (Table 3-46).

It is important to note that harvest activities would mainly directly impact forested wetland sites. Because of the lack of commercial timber within muskegs or other non-forested/scrub-shrub wetland habitats, these areas would not be harvested. Revegetation of forested wetlands sites is expected to occur in the same time frame as other forested sites, usually within 3 to 5 years. Consequently, long-term effects on forested wetlands are expected to be minor. Timber site productivity on wetland soils, however, is typically lower than on better-drained sites.

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Table 3-45.

#### Acres of Wetlands in Harvest Units under the Alternatives<sup>1/</sup>

Wetland Type <sup>2/</sup>	Alternative 2			Alternative 3			Alternative 4			Alternative 5		
	Total Acres	Clearcut	Selection Harvest	Total Acres	Clearcut	Selection Harvest	Total Acres	Clearcut	Selection Harvest	Total Acres	Clearcut	Selection Harvest
PFO	327	113	214	398	49	349	394	0	394	268	113	155
(4,240 acres)	(8%)	(3%)	(5%)	(9%)	(1%)	(8%)	(9%)	(0%)	(9%)	(6%)	(3%)	(4%)
PSS	5	0	5	4	0	4	4	0	4	3	0	3
(219 acres)	(2%)	(0%)	(2%)	(2%)	(0%)	(2%)	(2%)	(0%)	(2%)	(1%)	(0%)	(1%)
PEM	28	7	21	22	3	19	21	1	20	10	4	6
(2,580 acres)	(1%)	(<0.5%)	(1%)	(1%)	(<0.5%)	(<1%)	(1%)	(<0.5%)	(1%)	(<1%)	(<0.5%)	(<0.5%)
<b>Total</b>	<b>360</b>	<b>120</b>	<b>240</b>	<b>424</b>	<b>52</b>	<b>372</b>	<b>419</b>	<b>1</b>	<b>418</b>	<b>281</b>	<b>117</b>	<b>164</b>
(7,925 acres <sup>3/</sup> )	(5%)	(2%)	(3%)	(5%)	(<1%)	(4%)	(5%)	(<0.5%)	(5%)	(<4%)	(1%)	(2%)

1/ Note that harvest would not take place on many of these wetland sites, particularly PSS and PEM wetlands.

2/ PFO=Palustrine Forested, PSS= Palustrine Scrub-Shrub, PEM= Palustrine Emergent.

3/ Includes total acreage of wetlands within Project Area.

Table 3-46.

#### Length and Area of Wetland Impact from Roads under the Alternatives

Roads in Wetlands					
Wetland Type <sup>1/</sup>	Alt. 1	Alt. 2	Alt 3	Alt 4	Alt 5
PFO	0	5.9	2.0	0.1	5.5
PSS	0	0.2	0	0	0.2
PEM	0	0.4	0.2	0	0.3
<b>Total Length</b>	<b>0</b>	<b>6.5</b>	<b>2.2</b>	<b>0.1</b>	<b>6.0</b>
<b>Total Acres<sup>2/</sup></b>	<b>0</b>	<b>39.4</b>	<b>13.3</b>	<b>0.6</b>	<b>36</b>

1/ PFO=Palustrine Forested, PSS= Palustrine Scrub-Shrub, PEM= Palustrine Emergent.

2/ Assumes a 50 foot ROW

Wetlands associated with riparian habitats, and muskegs, were avoided to the greatest extent possible when flagging road routes in the field. However, in some instances, wetland areas could not be avoided due to topographic/engineering constraints encountered during road layout. The filling of wetlands by associated road systems poses the greatest direct effect of wetlands from project implementation. The construction of roads permanently removes the roaded portions of wetlands from production. Additionally, sedimentation from road construction and use has been found to indirectly impact wetland ecosystems (Stoeckeler, 1967; Boelter and Close, 1974). Table 3-46 shows the miles and acres of road construction on wetlands, by wetland type, under the alternatives. A maximum area permanently covered by road fill was calculated using a width of 50 feet, although it is recognized that the width of road fill may be substantially less in some areas depending on site conditions. Overall, the largest impact on wetlands from roads would occur under Alternative 2 followed by Alternative 5.

Forest-wide standards and guidelines require that beaches and estuaries be buffered by a 1,000-foot no-harvest zone. Road construction should avoid this buffer but can occur within it when there is no suitable alternative. Two LTF sites are located along the beach and estuarine zone in the Project Area (Jenkins Cove and Moose Creek). These areas do not occur within estuarine habitats, but do occur within beach fringe. Small areas of beach fringe would be directly impacted by LTF construction. Adjacent beach fringe and estuarine habitats may be slightly impacted by increased organic matter (wood debris) that may be transported to these habitats from the LTF sites by ocean currents. Additionally, sediment from associated road construction and mass wasting relating to upslope timber harvest that enters streams will eventually be delivered to the estuarine zone. Estuaries are natural deposition zones for fine-grained sediments and all aquatic



organisms are adapted to this process. Therefore, except for the direct effects on the beach fringe zone area at the two LTF sites, all alternatives would have minimal biologic effects and should not adversely affect biotic populations in beach fringe and estuarine areas.

## **Cumulative Effects**

Future harvest entries, road building, and road use by the Forest Service and the State of Alaska on state lands within the Project Area would likely continue with a low to moderate disturbance level on wetlands in several of the watersheds. Cumulative effects on wetlands would be proportional to the level of harvest and road building that occurred. Table 3-47 shows the maximum percent of wetlands currently included in harvest units within Project Area watersheds. It should be noted that most harvest units have prescriptions that remove 50 percent or less of the timber volume. Thus, wetland effects are not as high as are indicated in the table and so the table represents a worst case scenario. The highest cumulative effects to wetland systems from harvest and roading on National Forest lands would occur in Jenkins Creek (AA6A) and the small coastal (000Z) watersheds (primarily 0Z04). Overall, because of the relatively low intensity of harvest and low acreage of wetlands affected by the alternatives, significant cumulative effects on wetland resources are not anticipated from proposed project activities. Additionally, revegetation of forested wetland sites generally occurs in the same time frame as other forested sites, usually within 3 to 5 years. Consequently, long-term effects on forested wetlands are expected to be minor.

Table 3-47.

**Maximum Acres of Wetlands Affected by Proposed Harvest Under the Action Alternatives (Alternative 2) Relative to Existing Wetland Acres (only watersheds with proposed harvest are shown)**

Watershed	Watershed Acres	Existing Wetland Acres <sup>1/</sup>	Wetland Acres Affected by Harvest <sup>2/</sup>	Percent of Wetlands Affected <sup>3/</sup>
Glacier Creek	9,022	1,219	1	0.1
Virginia Lake	2,662	426	10	2.3
Gypsy Creek	2,812	1,775	117	6.6
Jenkins Creek	905	489	132	26.7
Madan Bay (AA7A and A09A)	1,050	173	5	5.4
Moose Creek	5,004	286	4	1.4
A13A	1,050	221	1	0.3
00Z4	878	474	71	15.0
00Z5	1,112	277	21	7.5
000Z <sup>4/</sup>	3,102	757	96	12.6

1/ Acres of wetlands within watershed.

2/ Wetland acres within harvest units under the alternative with maximum harvest acreage. Note that most harvest units have prescriptions that remove 50% or less of the timber volume.

3/ Percent of wetlands affected by harvest under the proposed alternative.

4/ 000Z watersheds combined.

The state lands that are west of Virginia Lake may be harvested and roaded in the future although there are no harvest plans within the next 10 years. Depending on the degree of harvest and road building, these actions may impact wetlands that occur within watersheds associated with these areas (0Z04, 0Z03, Virginia Lake (A07D), 0Z02, A06A, and 0Z01). The most significant effect would occur from roading within wetland areas since this would permanently adversely impact wetland sites. The percent loss due to



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road construction within watersheds is presented in Table 3-48. Cumulative effects on wetlands from road construction would be minimal due to the low acreage loss within the watersheds. Also note that these figures represent maximum acres because Alternative 2 develops the maximum road mileage and the average wetland filling width associated with road construction would be less than 50 feet. The projected harvest in 2007 and 2011 in the Crittenden Creek drainage on National Forest System lands would not affect wetlands in Madan project watersheds.

Table 3-48.

**Maximum Acres of Wetlands Affected by Proposed Road Construction under the Action Alternatives (Alternative 2) Relative to Existing Wetland Acres (only watersheds with proposed roads are shown)**

Watershed Name	Watershed Acres	Existing Wetland Acres	Miles in Wetlands	Acres of Wetland Loss <sup>1/</sup>	Percent of Wetland Acres Affected <sup>2/</sup>
Virginia Lake	2,662	426	0.08	0.4	0.2
Gypsy Creek	2,812	1,775	2.45	14.0	0.8
Jenkins Creek	905	498	1.11	6.4	1.2
Madan Bay (AA7A and A09A)	1,050	173	0.21	1.2	0.7
A14A	5,004	286	0.04	0.2	0.8
000Z <sup>3/</sup>	382	153	2.60	15.0	9.0

1/ Assumes a 50-foot right-of-way. Note that the actual width to be filled is expected to be less than 50 feet.

2/ Percent of wetlands within watershed affected by road construction.

3/ 000Z watersheds combined.

Over the next 50 to 100 years, harvest and road construction could take place over much of the Madan and Crittenden Project Areas, resulting in considerable additional road development and harvest. The LUDs in the area together with the Forest-wide standards and guidelines defined by the Forest Plan, should prevent significant cumulative effects on wetland resources over the long term.

## Lands

The majority (approximately 42,800 acres) of land in the Project Area is National Forest System land. There is also state land (approximately 1,300 acres) in the Project Area, located on either side of Mill Creek between saltwater and the southwestern part of Virginia Lake. The Forest Service has an easement with the state for the Mill Creek Trail. State lands also extend north of the Project Area to include the area around the mouth of Crittenden Creek. There is one parcel (approximately 76 acres) of private land in the Project Area associated with a mine in the upper Porterfield Creek drainage.

The National Forest System land in the Project Area has been assigned six LUDs in the Forest Plan (Table 3-49). All of the LUDs except Old Growth Habitat permit some timber harvest in varying amounts. Timber production is one of the primary emphasis areas for two of the LUDs, Timber Production and Modified Landscape. Figure 3-4 depicts the locations of the LUDs in the Project Area.

Table 3-49.

**Land Ownership and LUDs Within the Project Area**

Ownership	LUD	Acres
National Forest System	Old-Growth Habitat Reserves	3,201
	Recreational River	3,210
	Scenic Viewshed	16,077
	Modified Landscape	16,700
	Timber Production	<u>3,615</u>
	<b>Subtotal</b>	<b>42,803</b>
State and Private		<u>1,376</u>
	<b>Total</b>	<b>44,179</b>

In recent years, the state identified several potential timber sales in the vicinity of the Madan sale. These potential sale areas were identified as the Virgin Point sale (located at the very southern portion of the state land adjacent to the Madan project), the Mill Creek sale (located north of Mill Creek and adjacent to the Madan sale area) and the Crittenden Creek sale (located north of the Mill Creek sale area).

The ADNR is in the process of planning for future land use on state lands in Southeast Alaska. Until all the lands are classified, they will not be scheduled for timber harvest. Of the potential sale areas in the vicinity of the Madan project, the Crittenden Creek sale is considered the most likely to occur and it would probably not occur for at least 10 years (personal communication, J. Elasier, Juneau Area Forester, ADNR, 1999).

All alternatives associated with the Madan Timber Sale would be consistent with the Forest Plan. All standards and guidelines for each LUD included in the Forest Plan would be followed.

## Wild and Scenic Rivers

The Recreation River LUD that encompasses the Virginia Lake and Creek system begins at the edge of state lands, continues up Mill Creek to Virginia Lake, and extends beyond Virginia Lake up Porterfield Creek. The entire proposed corridor is approximately nine miles in length and encompasses 3,240 acres of National Forest System land. The river was recommended for Recreation River designation, in part, to allow for potential future road development. Recreation River designation would permit timber harvest adjacent to and within the corridor as long as VQOs are met, and as long as the adjacent LUD permits timber harvest.

None of the alternatives would place any harvest units within the 0.25-mile corridor of the Virginia Lake and Porterfield Creek system. Alternatives 2 and 5 would place harvest units approximately 0.25 mile from the south shore of Virginia Lake; however, the units would have a harvest prescription that would not be noticeable from the lake.

## Heritage Resources

Heritage resources generally represent past human activities. While the Project Area is close to the mouth of the Stikine River and adjacent to a site identified as an early Stikine



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Tlingit village, relatively few heritage resources were identified during heritage resource surveys for the project. The archaeological team recorded three heritage resource sites in the Project Area, including a shell midden of cultural origin (Site 49-PET-461), an intertidal, wood stake fish weir complex (Site 49-PET-462) with a nearby Culturally Modified Tree (CMT); and a short-term campsite with petroglyphs (Site 49-PET-463). Forest Service staff from the Petersburg and Wrangell Ranger Districts and paleontologists from the University of South Dakota recorded a karst feature (friatic tube) (49-PET-482) within the Project Area containing a stone artifact, a bone tool, and a shell bead. Within the larger study area, there are previously recorded petroglyphs and a Tlingit village overlain by an historic mill (Site 49-PET-023) on state land.

After application of the eligibility criteria for the National Register, the Forest Service recommended to the Alaska SHPO that the three sites recorded during the inventory of the sale area and the karst feature (49-PET-482) are eligible (C. Jorgensen to J. Bittner, letter, 8 June 1999, Madan Timber Sale Planning Record). Based on the known presence of petroglyphs and historic material, plus the reported presence of the ancestral Tlingit village, the Forest Service and SHPO have concurred on the eligibility of Site 49-PET-023 (Waterfall Town) for the National Register.

A discussion of previous heritage resource surveys can be found in the Madan Timber Sale EIS Cultural Resources Specialist Report (Greiser, 1999), copies of which are at Forest Service offices, the Alaska SHPO, and the Wrangell Cooperative Association (the Federally recognized Indian Tribe with traditional ties to the Project Area). Generally, copies of these reports are not available to the public due to the sensitive nature of heritage resources and the need to protect them. The earlier heritage resource work provided a starting point for the planning and implementation of the current heritage resource inventory. The heritage resources study for the Project Area was designed to satisfy federal and state resource management legislation as summarized in regulations prepared by the President's Advisory Council on Historic Preservation (Advisory Council), entitled, "The Protection of Historic and Cultural Properties" (36 CFR, Part 800). These regulations encompass the requirements of Section 106 of the NHPA of 1966 (as amended), the NEPA of 1969, and FSM 2300, among other laws and regulations. The heritage resource inventory plan, consistent with Forest Service and Alaska Heritage Resource Survey (AHRS) guidelines, included pedestrian examination of the ground surface, along with subsurface investigation where necessary, to recover adequate data to assess the potential for significant resources in the Project Area.

Heritage resource standards and guidelines developed and refined over the past several years by archaeologists on the Tongass National Forest and incorporated into a Programmatic Agreement with the Advisory Council and the Alaska SHPO define high and low sensitivity zones based upon the probability that they may contain heritage resources. The heritage resource study was conducted following the definition of high sensitivity zones that includes "All land between lower low water and 100 feet of elevation, with no consideration of slope." High sensitivity areas include passes; portages; Class I streams and lakes, including areas of barrier falls; fossil beaches or terraces; areas of caves or rockshelters; myth or legend sites; raw material source areas; lode or placer mining areas; and areas identified by historical, ethnographic, or oral history research. "The low sensitivity zone on the Tongass National Forest and immediately adjacent lands includes all land not relegated to the high sensitivity zone (Programmatic Agreement, 1995)."

In July of 1998, archaeologists conducted an inventory for heritage resources on approximately 700 acres within the Project Area. The inventory initially focused on several proposed harvest units (all located in the low sensitivity zone) and along proposed roads in high sensitivity zones. No new heritage resources and only one CMT were





located during intensive inventory of about 200 acres in or adjacent to harvest units and roads. However, one site located along the shore is near the proposed Moose Creek LTF (49-PET-462). As inventory of the proposed harvest units and roads neared completion, approximately 500 additional acres were surveyed in a continuous strip along the shoreline from north of Berg Bay to the boundary with State of Alaska lands at the north end of the Project Area. Inventory in these high sensitivity areas resulted in the location and evaluation of two other previously unrecorded sites (49-PET-461 and 49-PET-463).

### ***Environmental Effects***

Forest Service and State of Alaska, Office of History and Archaeology general objectives for undertakings such as the Madan Timber Sale are to document heritage resources and to preserve and protect National Register eligible resources. Where avoidance and *in situ* preservation are not viable management options, measures are implemented to recover data as a way of mitigating adverse effects to significant heritage resource properties.

Direct effects on heritage resources may result from activities such as road building, logging, or construction of LTFs. While natural processes, such as erosion and redeposition, can also adversely affect heritage resources either by covering the resources with sediment or uncovering and washing away resources when a channel changes, such processes can be accelerated by logging-related activities. Indirect effects on heritage resources, such as changes in stream flow or sediment loads, vandalism, or disturbance to the resources resulting from increased access to an area, may result from logging and road building.

Alternative 1 would result in no effect on known heritage resources in the Project Area. Construction of both the proposed Moose Creek road and the proposed LTF west of the mouth of Moose Creek under Alternatives 2, 3, and 4 have the potential to indirectly affect Site 49-PET-462 and the nearby CMT. The remains of the fish weir site, used by early Native peoples, could sustain indirect impacts such as changes in channels or unauthorized collection of cultural material. Under Alternative 5, neither construction of the Moose Creek road nor the LTF west of the mouth of Moose Creek would occur; therefore, this alternative would result in no effect on known heritage resources in the Project Area.

The preferred management approach for heritage resource sites by the Forest Service and other agencies is avoidance. The SHPO has concurred with the Forest Service determination that, as a result of avoidances, there will be no effect to Sites 49-PET-023, 49-PET-461, 49-PET-463 and the karst feature (49-PET-482) as a result of implementing any of the action alternatives. Because there is potential for indirect effects on the fish weir complex at the mouth of Moose Creek (Site 49-PET-42), the Forest Service has initiated the following mitigation. First, the site was completely surveyed and recorded by a Forest Service archaeologist. In addition, a number of the wooden fish trap stakes were radio-carbon dated. Further, once the timber sale contract is executed, the purchaser will be advised to refrain from conducting ground-disturbing activities in this area. For all action alternatives, logging operators and road crews would be urged to avoid moving logs or equipment near shore areas to minimize impacts to shoreline sites and to stay within cleared rights-of-way and LTFs.

The Forest Service has developed and would implement a plan for monitoring potential effects to Site 49-PET-462 (see Appendix G). If the monitoring program documents effects to sites, then operations would be halted until alternative protection measures or mitigation could be implemented.

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On April 8, 1999, the Wrangell District Ranger, planning staff officer, and archaeologist met with the Wrangell Cooperative Association IRA Council. The Forest Service shared general information about the timber sale analysis and specific information about the heritage resource study. The Council did not express concern about effects to heritage resources as a result of the proposed timber sale.

#### ***Cumulative Effects***

Impacts from natural decay, landscape changes, private developments, and timber management activities potentially result in the loss of nonrenewable heritage resources in Southeast Alaska. Development activities of all kinds pose particular threats to heritage resources because such activities tend to be located in the same places that heritage resources are found, such as sheltered coastal settings.

It is impossible to determine the exact nature of resources that may have been previously disturbed in the Project Area. Intensive heritage resource investigations and mitigation measures have been implemented only since the 1980s. The implementation of updated research and survey designs based upon the results of previous work and current methods and techniques, combined with various mitigation measures, will preserve significant properties and provide data that will guide future research and management activities. In addition, current Forest Service management approaches for beach fringe/estuary and stream/lake protection will benefit heritage resources through decreased activity in high probability zones and reduced indirect effects, such as erosion or deposition of sediments, on heritage resources located in or near drainages or beach fringe areas.

There are currently no other timber sales underway or planned in or near the Project Area, with the exception of the Crittenden timber sale, north of the Project Area, which is scheduled for 2007 and 2011. Overall, because of current Forest Service survey and mitigation approaches, cumulative effects to heritage resources should be insignificant.

Over the next 50 to 100 years, harvest and road construction could take place over much of the Madan and Crittenden Project Areas, resulting in considerable additional road development and harvest. The LUDs in the area together with the Forest-wide standards and guidelines defined by the Forest Plan, should prevent significant cumulative effects on heritage resources over the long term.

#### **Socioeconomics**

The Project Area is located approximately 15 miles southeast of Wrangell, Alaska. Although Wrangell is the closest community to the timber sale area, Petersburg (about 67 miles to the northwest of the Project Area) also could experience some socioeconomic effects from the proposed sale. This discussion is drawn primarily from the Community Profiles and Socioeconomic Resource Report (Downs and Galginitis, 1999), the Forest Plan FEIS "Economic and Social Environment" section, and Appendix H (USDA Forest Service, 1997b), and the Final Supplemental EIS (USDA Forest Service, 2003). The interested reader is referred to these documents for a more detailed treatment of the timber sector and its community (and regional) context.

Both Petersburg and Wrangell have diverse private sector economies, but Petersburg displays a much more robust economy. In terms of those economic sectors most reliant on the use of local natural resources potentially affected by the proposed action (fishing and fish processing and recreation and tourism as well as timber), there are some differences between the communities. Petersburg's economy is more dependent on fishing, especially fish processing, and recreation and tourism, while Wrangell's economy has a greater timber dependence. Thus, while Petersburg shows a greater economic



diversity than Wrangell, the latter has a broader timber business base. Small-scale timber operators are important in both communities but produce more value-added product in Wrangell than in Petersburg. The economic dependence of specific communities upon timber supply is addressed in the Forest Plan regional and subregional discussions (USDA Forest Service, 1997b). The sensitivity of smaller communities to changes in the timber sector, especially mill closures, is a major point. This information is a component of the Forest Service estimate of future demand for timber from the Tongass National Forest (Appendix A).

### **Petersburg**

Petersburg has a moderate population by Alaskan standards (3,224 in 2000), but is relatively large in terms of geographical size. Petersburg's population was 7 percent Native in 2000. Petersburg has no road connections to other communities, but Mitkof Island has a developed road network due to past and ongoing timber harvest activities.

Petersburg's economy has been historically based on commercial fishing and timber harvests. Government sector employment and recreation/tourism activities have become increasingly important as the fishing and timber sectors have experienced some difficulties.

Data compiled by the Alaska Department of Labor indicate that there were 1,395 people employed in Petersburg in 1999. These data do not include self-employed workers and are by place of work not residence. Government (federal and other) was the largest employer, accounting for 34 percent of total employment. Seafood processing continued to play an important role in the economy accounting for 24 percent of total employment. Other important sectors included retail trade (20 percent) and services (10 percent). The retail trade and services sectors include recreation and tourism-related activities, such as lodging and recreation services. Wood products employment accounted for less than 1 percent of total employment in 1999 (USDA Forest Service, 2003).

The most recent systematic survey of community subsistence harvest and consumption dates from 1987. In terms of edible harvest, fish constituted 45 percent of the 1987 total harvest, deer 22 percent, invertebrates 17 percent, mammals other than deer 9 percent, plants 4 percent, and birds 3 percent (Betts et al., 1992). Salmon made up about 50 percent of the 1987 community fish harvest. The principal method of subsistence harvest of fish for Petersburg residents is rod and reel, and takes place close to the community. Petersburg residents also trap relatively close to their community, primarily on Mitkof Island but also using other nearby lands. They do not trap in the Project Area. More recent data indicate there currently is no documented subsistence harvest of deer or other subsistence species by Petersburg residents from the Project Area. The interested reader is referred to the Subsistence Resource Report (Galginaitis and Downs, 1999a).

### **Wrangell**

The community of Wrangell is located on the northern tip of Wrangell Island, about 155 miles south of Juneau, 40 miles south of Petersburg and 89 miles northwest of Ketchikan. Wrangell is a geographically dispersed community, although historical Wrangell is relatively concentrated and development outside of this area is comparatively recent. Wrangell is still important as a trading or "service" center, but the fishing and timber industries brought a measure of diversity and stability to the community. By 1916, fishing and forest products had become primary industries.

Cohen (1989) stated that the Wrangell of 1989 contained much the same mix of industry and services as the newly incorporated Wrangell of 1903; however, with the 1994 closure



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of the largest mill in town (which has recently reopened on a smaller scale), the mainstay of the local timber economy vanished overnight. After many years of continuity, Wrangell as a community is now in a position of trying to redefine its economic center. While Wrangell offers a deep-water port, both large and small cruise ship dockings were expected to total only 27 during 1998. Other tourism-related enterprises, such as flightseeing and boat-based tours and charter sports fishing, are present in Wrangell. These businesses vary in the strength of their dependence on cruise ship passengers for their customer base. Government-related employment is a relatively large and important component of the local economy. City positions include employment by the City of Wrangell (50 jobs), Wrangell School District (80 jobs), and Wrangell General Hospital (45 jobs); local employment by state agencies (25 jobs) include positions through Health and Social Services, Fish and Game, Transportation, and Public Safety; and local federal employment (50 jobs), includes positions with the Forest Service, Postal Service, and Customs (City of Wrangell 1998).

Wrangell had a total population of 2,308 residents in 2000. The town's population was approximately 16 percent Native.

Wrangell is important as a regional service center for trade and transportation. The available statistics do not demonstrate the seasonality of Wrangell's economy, but most significant economic activities peak in the summer. While fishing is important to Wrangell's economy, Wrangell residents do not earn as much from fishing as do residents of some other communities in the region. Thus, wage jobs are especially important in Wrangell. The last comprehensive description of Wrangell's economy is Cohen (1989), but the same general pattern persists through the present. The major changes are the decline of the timber sector and the increase in the tourism sector (Galginaitis and Downs 1999; Rushmore 1998, 1999). Cohen (1989) indicates that in 1987, the largest single employer in Wrangell was Wrangell Forest Products (174 to 197 employees). In 1987, four fish processors operated in Wrangell and employed 185 people during the peak season (with very few employees retained during off-season periods). Wrangell also has a developed secondary economy, which serves to multiply the economic importance of the base industries. In terms of relative contribution to Wrangell's economy, the most important sectors are indicated to be government (26.5 percent), timber (20.8 percent), fishing (20.2 percent), and transportation (10.3 percent) (Gove 1988 cited by Cohen 1989:29). Timber has substantially declined in terms of percentage since then.

Data compiled by the Alaska Department of Labor indicate that there were 823 people employed in Wrangell in 1999. These data do not include self-employed workers and are by place of work not residence. Government (federal and other) was the largest employer, accounting for 31 percent of total employment. Other major employers were the retail trade (18 percent), transportation (10 percent), construction (10 percent), and services (10 percent) sectors. The retail trade and services sectors include recreation and tourism-related activities, such as lodging and recreation services. Wood products and seafood processing accounted for 9 percent and 8 percent of total employment respectively (USDA Forest Service, 2003).

The most recent systematic survey of community subsistence harvest and consumption dates from 1987. In terms of edible harvest, fish constituted 45 percent of the 1987 total harvest, deer 12 percent, invertebrates 25 percent, mammals other than deer 10 percent, and other resources 8 percent. Of the total Wrangell 1987 subsistence fish harvest, 70 percent was taken by rod and reel, while 16 percent was taken by commercial gear, and 14 percent by non-commercial gear. Non-salmon fish made up 59 percent of the community's fish harvest. More recent data indicate that little community subsistence activity takes place in the Project Area. The only documented harvest is the trapping of furbearers, which is not likely to be affected by the proposed action. Interviews

determined that the Project Area is used for the harvest of a very low number of deer, but this pattern of use will also not likely be affected by the proposed action. The interested reader is referred to the Subsistence Resource Report (Galginaitis and Downs, 1999a).

## ***Overview of Local Commercial Timber Economy***

With the close of the Alaska Pulp Company (APC) mill in Sitka in 1993, and the subsequent close of the Ketchikan Pulp Company (KPC) mill in Ketchikan, the largest users of Tongass National Forest wood were removed from the market. This has created some dislocations in the regional timber economy. The APC sawmill in Wrangell continued operations for a time, but eventually closed. Ongoing changes in the regional timber economy are discussed in the Final Supplemental EIS (USDA Forest Service, 2003).

Regional effects have no doubt had some influence in both Wrangell and Petersburg, especially when combined with the relatively poor performance of the fishing economy during this time. This is probably most obvious in terms of the number of smaller-scale operators (especially from Wrangell and Prince of Wales Island) that are expressing interest in timber sales offered in the Wrangell and Petersburg Ranger District that are relatively far from their base of operations (this is especially true in the Petersburg Ranger District). Downs and Galginaitis (1999) list timber sales offered on the Stikine Area for 1993-1997 by volume and by the community of the highest bidder for each sale. Data presented in that same report indicate that while sales on the Wrangell Ranger District predominated during this time period in terms of absolute number of sales (25 of 37 sales, or 68 percent of the total), more timber volume was offered on the Petersburg Ranger District (62 percent of the total volume). Thus, the average offering on the Petersburg Ranger District was over four times that on the Wrangell Ranger District. Data for 1998-2002 indicate that sales on the Petersburg Ranger District accounted for 31 of 44 total sales (70 percent) and 72 percent of total sale volume. This pattern can be generally expected to continue, based upon the projected distribution of ASQ among the ranger districts of the Tongass National Forest (Appendix A).

Sale awards were differentially distributed by community by the size of the sale. Sales less than 1,000 MBF were considered "small" and tended to be won by local bidders. Sales of 1,000 MBF or more were considered "large" and tended to be won by non-local bidders. Of the 37 sales offered between 1993 and 1997, 26 were small sales, averaging 187 MBF, with a median of 132.5 MBF. The 11 large sales offered an average of 14,970 MBF, with a median offering of 11,439 MBF. No large sale offered less than 1,588 MBF. Wrangell bidders were awarded 16 of the 37 sales (43 percent), with 15 of these being in the small category. Ketchikan bidders were awarded 7 of the 37 sales (19 percent), 5 in the large category and 2 in the small category. Petersburg bidders were awarded four of the 37 sales (11 percent), all of which were small sales. Other communities with sale awards were Craig (two large sales), Juneau (one large sale), Kake (one small sale), Sitka (one large and one small sale), Thorne Bay (two small sales), and unknown (one large and one small sale).

Additional information presented in Downs and Galginaitis (1999) further differentiate between sales offered on the Petersburg and Wrangell Ranger Districts. Of the 25 sales offered on the Wrangell Ranger District, 19 (76 percent) were small sales. Of the 19 small sales, 13 (68 percent) were awarded to Wrangell bidders. Of the six large sales offered on the Wrangell Ranger District, only one was awarded to a Wrangell operator. Of the 12 sales offered on the Petersburg Ranger District, 7 (58 percent) were small sales. Of the seven small sales, four (57 percent) were awarded to Petersburg bidders and two (29 percent) to Wrangell bidders. All of the five large sales offered on the Petersburg Ranger District were awarded to non-local operators.



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Of the 44 sales offered on the Petersburg and Wrangell Ranger Districts between 1998 and 2002, 23 were less than 1,000 MBF in size with an average sale volume of 286 MBF. The majority of these sales went to Wrangell or Petersburg bidders. The 21 large sales included a total of approximately 146 MMBF, with an average sale volume of 6.9 MMBF. Wrangell bidders were awarded 14 of the 21 large sales (67 percent), with the remaining large sales awarded to Craig (5 sales), Petersburg (1 sale), and Ketchikan (1 sale) bidders.

#### ***Socioeconomic Effects***

Given the discussion above regarding the local timber industry, a reasonable assumption is that it is unlikely that current timber operators in Petersburg will be significantly affected by the Madan sale. Petersburg timber operators have so far confined their activities to the general Petersburg region. As noted in the community profile, the overall role of timber in the economy of Wrangell has changed in recent years, with a drop in the volume of locally available timber, and a reduction in the number of timber-related and timber support service-related businesses. The Madan Timber Sale, by itself, will most likely affect the area through its effects on local timber operators. All local timber operators indicated that a reliable and predictable timber supply is most important to them in terms of economic viability. The Madan Timber Sale would contribute to the predictable timber supply (Appendix A) to the extent that local operators can bid on the offerings from the sale. The No-Action Alternative, by not offering additional timber, would have the greatest potential negative socioeconomic effects, by contributing to the continuation of negative trends in the local timber economy. To the degree the local timber economy is integrated with the larger economy of the community, negative socioeconomic impacts would be felt on the community level. All action alternatives have approximately the same potential for positive socioeconomic effects.

The differences in total volume offered in the various alternatives, considered in isolation, is not key in terms of producing measurable differences in potential socioeconomic effects. In contrast, the manner in which the total volume is offered (which is not specified in the alternatives, and would be a management function of the Wrangell Ranger District) could make a significant difference in terms of potential socioeconomic effects. Timber operators differ in their capabilities. The large operators could bid on the total volume for any of the action alternatives, but would also be likely to bid on all offerings of the Madan Timber Sale, no matter how the total volume is divided up. Smaller operators may not be able to competitively bid on a large, single offering. Dividing the total sale into smaller offerings may enable smaller Wrangell operators to compete for some of the timber, providing that the offerings can be made economically viable in relation to the amount of road building needed for the volume offered. The amount of cable harvest vs. helicopter yarding and the distance of helicopter yarding to a landing are also factors affecting the economic viability of smaller offerings from the project. Historically, larger regional operators are most likely to bid on relatively large offerings within the Wrangell Ranger District, while smaller offerings are less attractive to them.

#### **Subsistence**

Section 810 of ANILCA requires a federal agency, having jurisdiction over public lands in Alaska, to analyze the potential effects of proposed land use activities on subsistence uses and needs. An ANILCA 810 analysis must include several components. First, the proposed actions must be analyzed to determine if they significantly restrict subsistence uses. This analysis must be concluded with a draft determination either of "no significant effect" or a determination that clearly describes possible effects. For any conclusion other than "no significant effect," formal ANILCA hearings must be conducted.





Following these hearings, a final determination based on an analysis of the potential effects of the final proposed action must be published.

Evaluation criteria used to assess the effects of the alternatives are: 1) changes in abundance or distribution of subsistence resources; 2) supply and demand; 3) changes in access to subsistence resources; and 4) changes in competition from non-subsistence users for those resources. The evaluation determines whether subsistence uses within the analysis area or portions of the area may be significantly restricted by any of the alternatives. Wildlife, fish, shellfish, marine mammals, and other resources are evaluated. A complete Subsistence Resource Report (Galginaitis and Downs, 1999) has been completed and is in the planning record.

This discussion is drawn primarily from the Subsistence Resource Report. The interested reader is referred to this document for more detailed information on subsistence activities in the Project Area. The Subsistence Resource Report also provides a discussion of subsistence management in Alaska in the context of the ANILCA and federal/state conflicts. For federal management, only "rural" Alaskans are qualified subsistence users.

### ***Community Subsistence Harvest***

The Project Area falls primarily within the aboriginal use areas identified for the community of Wrangell (Goldschmidt and Haas, 1946: Wrangell Territory map). Residents of Wrangell, the community closest to the Project Area, are the primary contemporary subsistence users of the area. Petersburg residents do harvest subsistence fish resources in the Project Area, but there is no reported harvest of terrestrial resources in the area. There is no known subsistence use of the Project Area by residents of other communities.

Tongass Resource Use Cooperative Survey (TRUCS) maps indicate that Wrangell residents hunt the Project Area, and both Wrangell and Petersburg residents take subsistence salmon from waters near the Project Area. Analysis of 11 years of ADF&G harvest information indicates that the Project Area is not heavily used for subsistence harvest activities (ADF&G, 1998). Limited interviews were conducted to verify this low level of use (Galginaitis and Downs, 1999). Organizations contacted to obtain potential respondents included the Wrangell IRA, the Wrangell Resource Council, the Southeast Alaska Federal Subsistence Advisory Committee, potentially affected city governments (Wrangell, Petersburg), ADF&G (Wrangell, Petersburg, Juneau) and the Forest Service (Wrangell, Petersburg). Specific subsistence interviewees were chosen primarily because of a high level of subsistence activity in general and potential specific knowledge related to the Project Area.

Wrangell residents harvest a variety of subsistence resources, documented in most detail through the TRUCS of 1987 (Kruse and Frazier, 1988; Kruse and Muth, 1990, Kruse et al. 1988). In terms of edible harvest, fish constituted 45 percent of the 1987 total harvest, deer 12 percent, invertebrates 25 percent, mammals other than deer 10 percent, and other resources 8 percent (Betts et al., 1992, 1993). Of the total Wrangell 1987 subsistence fish harvest, 70 percent was taken by rod and reel, 16 percent was taken by commercial gear, and 14 percent was taken by non-commercial gear. Non-salmon fish made up 59 percent of the community's fish harvest. Salmon and other fish, thus, are an important subsistence resource. Petersburg displays a similar pattern but has no documented terrestrial harvest within the Project Area or the WAAs of which it is a part.

Overall documented subsistence terrestrial harvest from the Project Area is quite low (Table 3-50). Deer and marten appear to be the most sought after terrestrial mammals.

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Table 3-50.

**Summary Total Harvest Statistics by VCU in the Madan Project Area for Regulatory Years 1987-1996 (10 years)<sup>1/</sup>**

VCU	ADF&G	ADF&G	Wolf	Wolverine	Marten	Black Bear	Deer <sup>2</sup>
	GMU	WAA					
502	1B	1810	3	0	36 <sup>3/</sup>	0	12 <sup>4/5/</sup>
504	1B	1811	0	2	8 <sup>6/</sup>	3	7 <sup>7/</sup>

1/ The reported harvest for beaver, otter, and moose has been zero (0).

2/ All deer from WAAs 1810 and 1811 were harvested by Wrangell residents.

3/ 23 of 36 marten taken from VCU 502 were taken between 1995 and 1997.

4/ All deer harvested from WAA 1810 were taken in regulatory year 1988/1989.

5/ An additional 6 deer were harvested from WAA 1810 in regulatory year 1997/1998.

6/ All marten taken from VCU 504 were taken in the regulatory year 1995/1996.

7/ All deer harvested from WAA 1811 were taken in regulatory year 1993/1994.

Source: Tom Paul, ADF&G Division of Wildlife Conservation, 1997.

#### ***Deer Harvest within the Project Area***

The Project Area comprises relatively small parts of WAAs 1810 and 1811. WAA 1810 includes only VCU 502 portion of the Project Area and extends northward. WAA 1811 includes only VCU 504 portion of the Project Area and extends south and to the east. Only Wrangell residents reported harvesting deer from these WAAs. Wrangell's total community deer harvest over the 1987-1996 period was 4,027 deer, of which only 19 deer (0.5 percent of the total) were taken from these WAAs. Data for 1997 indicates that six deer were harvested from WAA 1810, but none from WAA 1811. No subsistence harvest effects are likely as a result of the action alternatives.

It is important to recognize, however, that not all subsistence impacts are directly related to harvest levels. During field interviews, a limited number of hunters indicated that they hunted the Madan area on a reasonably regular basis. They judged that the deer population in this area is relatively small, but they still hunt there at times because it is a relatively accessible area where they see few, if any, other hunters. They know the probability of a successful harvest is low, but the "hunting experience" and the "quality" of the hunt is deemed high. If the timber sale was to decrease local deer habitat or radically increase or encourage more access, these hunters would experience negative effects. In their view, however, these consequences were not likely to occur, and potential access effects have been minimized as much as possible through access management restrictions for all action alternatives.

None of the action alternatives would significantly affect subsistence deer use in the Project Area in terms of habitat effects. Further, none of the action alternatives can be differentiated in terms of such effects from the others. Deer habitat capability in the Project Area would decrease by 4 to 5 percent immediately after timber harvest, and by 4 to 6 percent by 25 years after timber harvest. Calculated "deer per square mile" would decrease from 10.8 before timber harvest to 10.3 to 10.4 immediately after timber harvest (see Issue 3, Wildlife). Deer habitat capability would range from 10.1 to 10.4 deer per square mile 25 years after harvest. The small decrease would have no effect on the already low level of subsistence use of the Project Area. The uncertainties associated with these estimates make the apparent differences between alternatives insignificant. The potential regional cumulative effects may be significant (discussed below), but cannot be differentiated by alternative and none of the alternatives would appreciably contribute to overall long-term regional cumulative effects.

The only available measures of deer numbers or habitat capability for community-wide subsistence use areas are those from the Forest Plan Final EIS (1997). The Final EIS notes that while 1995 estimates of deer habitat capabilities were 15 deer per square mile



for WAA 1810 and 18 deer per square mile for WAA 1811, documented harvest was only one deer per year for WAA 1810, and less than that for WAA 1811.

Under Road Management Option A, Alternative 2 would have the greatest amount (approximately 15 miles) of roads open to motorized travel and the least amount (approximately 4 miles) occurs under Alternative 4. Road Management Option B would close all roads to motorized travel. Open roads could potentially increase hunting activity and competition in the area. However, subsistence use in the area is considered minimal, therefore, the effects of both road management options are expected to be insignificant.

### ***Mountain Goat Harvest Near the Project Area***

No mountain goats are harvested within the Project Area, but some are taken from the mountainous areas to the north and east. It is possible that the action alternatives could reduce habitat that these goats use in the Project Area; however, no significant effects are expected (see Issue 3 – Wildlife Habitats and Species of Concern).

### ***Bear Harvest Within the Project Area***

Documented harvest of black bear from the Project Area is quite low, which is consistent with the limited interviews conducted in Wrangell and Petersburg. Most, if not all, bears harvested from the Madan area are taken opportunistically while hunters are pursuing other game. None of the alternatives or the proposed action will affect the subsistence harvest of bears from the Project Area.

### ***Furbearer Harvest Within the Project Area***

The take of marten in the last two years may indicate an increase in trapping effort. The few trappers who use the Madan area are residents of Wrangell. Their families have trapped the area for a considerable length of time and have essentially established usufruct<sup>1</sup> rights through their community-recognized trap lines. Trap lines are run using a boat, as all trapping in the area is on the beach or, in the case of marten, a short distance inland from the beach. Marten trapping could be affected, as marten travel routes could be more easily disrupted by timber harvest than those of other furbearers. However, even this potential effect is limited by the 1,000-foot beach fringe buffers required by the Forest Plan. Very few wolves or wolverines are harvested in or near the Project Area; thus, no significant subsistence effects are anticipated.

The construction and operation of log transfer facilities and equipment ramps at Jenkins Cove and near Moose Creek should not significantly affect the overall operation or success of current trap lines. However, if these facilities function to increase access to the Madan area, trapping activities could be disrupted by other area users. Under Road Management Option A, most roads would be open to motorized use, thus potentially increasing access to the area. Under this option, Alternative 2 would have the most open roads (15 miles) and Alternative 4 would have the least (4 miles). Road Management Option B would close roads to motorized vehicles although mountain bikes and hikers would be allowed. Open roads could potentially increase trapping pressure in newly accessible areas; however, neither road management option is expected to have significant effects due to the minimal subsistence use in the area. Current informal community understandings regarding established use by specific individuals also limits the level of

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<sup>1</sup> The right to use and enjoy the profits and advantage of something belonging to another so long as the property is not damaged or altered.



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trapping effort in the area. Therefore, changes in access resulting from the action alternatives are unlikely to affect furbearer trapping in terms of increased competition.

#### ***Marine Mammal Harvest Within the Project Area***

There are no apparent effects from the action alternatives on either marine mammal populations or marine mammal hunting activities, so potential subsistence effects would be insignificant.

#### ***Fish Harvest Within the Project Area***

Fish are a significant resource for area communities, both commercially and for subsistence/personal use/home consumption. Fish generally comprise over 50 percent of total subsistence harvest by weight for any given community.

Currently, the State of Alaska manages the fisheries in and around the Project Area. These fisheries consist primarily of gill net and purse seine commercial salmon fisheries in Earl West Cove and the Mill Creek area. State subsistence/personal use salmon fisheries in or near the Project Area also take place in Earl West Cove and the Mill Creek areas. State management of personal use/subsistence fishing had been evolving even before the recent break between federal and state subsistence resource management orientations, primarily in the direction of fewer subsistence fisheries and more personal use fisheries (Bosworth, 1991).

In the recent year with highest reported use, 1990, 8 percent of Wrangell residents with subsistence personal use fishing permits used Earl West Cove. Mill Creek is a higher use subsistence personal use fishing area, especially for red salmon, but also for chum salmon. In 1995, 37 percent of all Wrangell area permit holders used Mill Creek. Most of this use dates from 1992 to the present, with use becoming heaviest after 1994 (Table 3-51). Despite the relative importance of these resources, no significant effects are expected from any of the action alternatives. The Earl West Cove fishery is a terminal salmon fishery on hatchery stock, which limits the potential environmental consequences of project-related activities. Under the action alternatives, the Mill Creek fishery would be adequately protected by Forest Plan standards and guidelines and by the limited harvest that would occur in the watersheds that feed Mill Creek (see Watershed and Fish Resources).

#### ***Cumulative Effects***

Due to the low level of subsistence activity in the Project Area, the action alternatives would not have any significant effects on these activities. Potential long-term, interactive, or cumulative effects of all the alternatives are essentially equivalent because there are only minor differences (if any) in their potential consequences. All potential long-term, interactive, or cumulative effects are a result of natural conditions and regional dynamics to which the proposed actions have little, if any, contribution.

Table 3-51.

**Summary of Personal Use/Subsistence Permits and Catch for 1988-1997, Wrangell Area  
(Earl West Cove and Mill Creek)**

Year	Total Wrangell Area Permits	Earl West Cove						Mill Creek						
		Permits	Kings	Reds	Cohos	Pinks	Chums	Permits	Kings	Reds	Cohos	Pinks	Chums	
1988	75	0	0	0	0	0	0	0	0	0	0	0	0	
1989	92	1	Confidential						0	0	0	0	0	
1990	112	9	24	0	121	0	20	0	0	0	0	0	0	
1991	101	6	52	3	2	0	13	3	1	18	0	16	0	
1992	118	0	0	0	0	0	0	16	3	169	0	4	21	
1993	123	3	5	0	7	0	0	15	2	189	0	0	4	
1994	122	3	3	0	0	0	7	40	5	442	1	4	42	
1995	140	7	22	0	41	4	14	52	15	657	1	4	110	
1996	126	5	7	1	15	0	10	41	19	441	1	6	341	
1997	97	2	Confidential						29	5	251	2	21	85

Source: Gordie Woods, Alaska Department of Fish and Game, Wrangell (1998)

The Forest Plan Final EIS and Record of Decision (1997) determined that full implementation of the Forest Plan may result in a significant possibility of a significant restriction to subsistence use of deer in some areas of the Forest (1997 ROD, pg 36-37; TLMP FEIS, pg 3-210 to 3-229). In this case, full implementation of the Forest Plan would be considered the maximum possible impacts regarding effects to subsistence resources and restrictions on subsistence users. Because timber harvest and road building have not occurred at the rates projected in the Forest Plan, the effects will be less, but by assuming full implementation, full disclosure of the greatest possible impacts is made. As of 2003, the Forest Service is not even approaching full implementation of the Forest Plan regarding timber harvest and road construction, the primary actions that affect subsistence resources and users. The 1997 ROD established an Allowable Sale Quantity of 267 million board feet and anticipated up to 150 miles of new road construction annually. During the past 5 years (1998 – 2002), an average of 98 million board feet has been harvested and 18 miles of new road construction has occurred annually on the Tongass (Appendix A).

The Forest Plan Final EIS (1997) concludes that, for Wrangell and Petersburg residents, the selected alternative would provide adequate deer to satisfy all demand for deer through the year 2005, within those areas that the communities normally use for most deer harvest. Sufficient deer to satisfy the demand from all rural hunters could be satisfied through the year 2095 for those same areas. The demand for deer for all hunters through the year 2095 will not be met for those areas most important to Wrangell and Petersburg hunters, but subsistence needs will continue to be met.

Future subsistence effects for Wrangell and Petersburg community subsistence use areas appear to be inevitable. They are not the result of the action alternatives for the Madan Timber Sale, and the action alternatives would contribute only a very small and almost certainly unmeasurable amount to the potential cumulative effects. Rather, such cumulative effects will result from increased demand due to increased human population and the potential regional decrease in deer population resulting from harsher winter conditions. Even these cumulative regional effects should not affect or change the subsistence use patterns of the Project Area.

For the main use area of Wrangell hunters (from which 75 percent of that community's deer are harvested), the Forest Plan Final EIS (1997) concludes that its selected alternative will continue to provide sufficient deer habitat capability to satisfy the total



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demand for deer through 2005. It will also provide sufficient deer habitat capability to satisfy the demand for deer for all rural hunters through 2095 (USDA Forest Service, 1997b). The same is concluded to be the case for the main use area of Petersburg hunters (USDA Forest Service, 1997b). Non-rural hunters demand for deer in these areas is projected not to be met, in small part due to the long-term decline in deer habitat capability, but primarily due to the increased demand for deer through time due to increased human population throughout the region. Thus, in the absence of unforeseeable factors, effects on subsistence uses of the Project Area are expected to be small or nonexistent.

#### ***ANILCA 810 Findings***

These findings are based on the evaluations in the Subsistence Resource Report (Galginaitis and Downs, 1999) on abundance, distribution, supply and demand, access, and competition for harvested resources in the study area. They are also based on the ANILCA Section 810 subsistence hearing that was held for the Project in Wrangell, Alaska on March 14, 2003. One individual attended the meeting and did not testify.

The area is not an extensively used subsistence harvest area. There would be slight decreases in habitat capability for wildlife under the action alternatives (10.8 to 10.1). However, the habitat would be capable of maintaining populations greater than projected subsistence harvest demand under all alternatives through the rotation (2095). The effects on fish and shellfish populations are expected to be minimal and will not affect the supply available for subsistence harvest.

Although there may be slight long-term changes in access, the level of increased access will not reduce subsistence harvests below historic levels, and the habitat capability will be sufficient to meet some, if not all, of the increased demand for deer. Alternative 2 would result in the construction of the most roads, followed by Alternatives 5, 3, and 4. No roads would be constructed under Alternative 1, which would therefore affect access the least. Under Road Management Option A most roads would be open to high-clearance vehicles. Option B would close roads to motorized vehicles although mountain bikes and hikers would be allowed. Closure of roads under Option B would further mitigate the effect of improved access. A substantial increase in competition for subsistence wildlife resources from non-rural community residents is not projected to result from the action alternatives.

Based on the projected deer subsistence use being met for Wrangell and Petersburg through 2095 and the results of the public subsistence hearing, the Forest Service has made the finding that there would not be a significant possibility of a significant restriction on subsistence uses of wildlife, fish, shellfish, marine mammals, and other resources as a result of implementing the Madan project.

#### **Irreversible and Irretrievable Commitments of Resources**

Irreversible commitments describe a loss of future options. Irreversible applies primarily to the effects of use of nonrenewable resources such as mineral extraction or destruction of a cultural resource site. Once these resources are gone, they cannot be replaced. Irreversible can also apply to factors such as soil productivity that are renewable only over long periods of time.

Irretrievable commitments apply to the loss of production, harvest or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is



irretrievable, but the action is not irreversible because if the use changes, it is possible to resume timber production.

The use of these terms to include in discussions of environmental consequences is found in 40 CFR 1502.16. The definitions above are found in the Forest Service handbook (FSH 1909.15, 05). The disclosure of effects for the Madan Timber Sale have been organized by direct, indirect and cumulative effects. Where necessary, irreversible commitments were identified, such as the ½ acre of forested wetlands that would be lost due to road construction (see Wetlands discussion), but generally timber harvest and associated activities are considered irretrievable commitments of resources.

## Energy Requirements and Conservation Potential of the Alternatives

The implementation of the proposed alternatives will require the expenditure of energy (consumption of fuel). The amount of energy used varies by alternative, based on the timber volume harvested, the type of harvest system used, the amount of road construction, and sale preparation and administration.

### *Fuel Consumption*

Fuel Consumption requirements were estimated as follows:

Timber Sale Preparation and Administration	1.56 gallons per MBF
Cable Logging	2 gallons per MBF
Helicopter Logging	8 gallons per MBF
Load, Haul, Dump, and Tow	8 gallons per MBF
Road Construction	4,000 gallons per mile
Road Maintenance	20 gallons per mile

The estimated fuel consumption required for each alternative is displayed in Table 3-52.

Table 3-52.

#### **Estimated Fuel Consumption (Thousands of Gallons)**

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Cable Logging	0	36.6	16.2	14.5	22.0
Helicopter Logging	0	111.1	87.7	97.8	77.0
Load, Haul, Dump, Tow	0	257.4	152.4	155.9	165.2
Road Construction	0	85.2	36.0	26.8	58.8
Road Maintenance	0	0.5	0.2	0.1	0.3
Timber Sale Preparation/Administration	0	50.2	29.7	30.4	32.2
Total Consumption	0	541.0	322.2	325.5	355.5
Average Gallons per MBF	0	16.8	16.9	16.7	17.2

### **3 Affected Environment and Environmental Consequences**

#### **Unavoidable Environmental Effects**

Although harvest units and roads were designed to avoid adverse consequences, and have included mitigation measures, some environmental impacts cannot be completely mitigated and would be expected to occur.

Air quality would diminish on a recurring, temporary basis due to the construction of roads, timber harvest, and hauling. Limbs and logging slash would be burned at sort yards intermittently throughout the logging periods, which would deposit minor amounts of particulate matter and smoke into the air.

Although BMPs are designed to protect soil and water, some potential for surface erosion, sediment production, channel erosion, and mass movement does exist. Road development poses a risk of sediment production; however, the degree of risk posed by the proposed roads is not unusually high. Road locations are largely in stable terrain. Helicopter yarding in all alternatives, but especially in Alternatives 3 and 4, reduces the risks associated with road building. Sediment production could displace fish or result in a loss of habitat near stream crossings and temporarily affect the function of the freshwater system.

Increased human activity both during and after logging, and loss of habitat, would result in impacts to fish and wildlife species, particularly those populations that have low numbers or are more sensitive to the presence of people. The habitat for old-growth associated species would be reduced. Travel corridors between old-growth blocks in adjacent watersheds would also be reduced in size, which may affect the ability for individuals to disperse and genetic material to exchange among local populations of species.

#### **Short-term Uses and Long-term Productivity**

The use of natural resources for long-term sustained yield is at the basis of National Forest management and direction. The proposed timber harvesting under the BMPs, Forest Plan standards and guidelines, Forest Plan LUD direction will result in no long-term loss in productivity.

#### **Effects on Prime Farm Land, Range Land, and Forest Land**

No prime farm land or range land would be adversely impacted by the action alternatives. Forest land would maintain its productivity, except for those lands permanently occupied by roads built for long-term access for forest management.

#### **Effects on Civil Rights, Women, and Minorities**

There would be no adverse impacts on civil rights, women, and or minorities as a result of any of the alternatives.

This conclusion tiers to the Economics and Social Environmental Analysis included in Chapter 3 of the Forest Plan.

### **Executive Order 11988**

Executive Order 11988 directs Federal agencies to take action to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. The many streams in the Project Area make it impossible to avoid all floodplains during road construction. The design of the proposed developments and the application of BMPs combine to minimize adverse impacts on the floodplains. During the planning process for the Moose Creek watershed, the LTF was moved and roads were rerouted so that no floodplain crossings are required in any of the action alternatives. The only crossings in the Project Area are of Jenkins and Gypsy Creeks, where the floodplains are narrow.

### **Executive Order 11990**

Executive Order 11990 requires Federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. Soil moisture regimes and vegetation on some wetlands may be altered in some harvest units; however, the affected wetlands will meet wetland classification and will still function as wetlands in the ecosystem.

Road construction results in the filling of wetlands and creates a permanent loss of wetland habitat. Because wetlands are so extensive in the Project Area, it is not feasible to avoid all wetland areas; however, wetlands are avoided whenever practicable. Effects will be minimized by not using wetlands as sites for overburden disposal and avoiding road construction through wetlands whenever practicable. Implementation of BMPs, minimizing ditching, and providing adequate cross drainage will also help minimize the area affected.

### **Executive Order 12898**

Executive Order 12898 directs Federal agencies to identify and address the issue of environmental justice, i.e., adverse human health and environmental effects of agency programs that disproportionately impact minority and low income populations. Implementation of the action alternatives will not cause adverse health or environmental effects that disproportionately impact minority and low income populations. Public scoping and the analysis in the subsistence section of the EIS contribute to meeting this Executive Order. Refer to the Socioeconomics, Subsistence, and Heritage Resources sections for further information.

### **Executive Order 12962**

Executive Order 12962 directs Federal agencies to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. Section 1 of the Executive Order is most pertinent to the proposed activity. Section 1 directs Federal agencies to evaluate effects on aquatic ecosystems and recreational fisheries, develop and encourage partnerships, promote restoration, provide access, and promote awareness of opportunities for recreational fishery resources.

The effects of this project have been evaluated throughout the EIS, including effects to freshwater and marine resources. Partnerships are continuing to be used to leverage Federal project funds to address water quality concerns in areas of the Tongass National



### 3 Affected Environment and Environmental Consequences

Forest, although none have been proposed for recreational fisheries in conjunction with this project.

Under the action alternatives (Option B), road closures would only provide access for recreational fishing opportunities to those willing to walk or mountain bike into the Project Area. Even under Road Management Option A, the impact of improved access on recreational fishing opportunities is expected to be very minor, due to the expected limited use of the area (see Recreation section of Chapter 3).



# **CHAPTER 4**

## **REFERENCES CITED**

CHAPTER 1

THE HISTORY OF THE





# CHAPTER 4

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# CHAPTER 5

## GLOSSARY

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### **Access Management**

The designation of roads for differing levels of use by the public.

### **Alaska National Interest Lands Conservation Act (ANILCA)**

Passed by Congress in 1980, this legislation designated 14 National Forest wilderness areas in Southeast Alaska. Section 810 requires evaluations of subsistence impacts before changing the use of these lands.

### **Alaska Native Claims Settlement Act (ANCSA)**

Approved December 18, 1971, ANCSA provides for the settlement of certain land claims of Alaska natives and for other purposes.

### **Allowable Sale Quantity (ASQ)**

The maximum quantity of timber that may be sold each decade from suitable lands covered by the Forest Plan.

### **Anadromous Fish**

Anadromous fish spend part of their lives in fresh water and part of their lives in salt water. Anadromous fish include pink, chum, coho, sockeye, king salmon, and steelhead trout. There are also anadromous Dolly Varden Char.

### **Aquatic Habitat Management Unit (AHMU)**

A mapping unit that displays an identified value for aquatic resources. It is a mechanism for carrying out aquatic resource management policy.

*Class I:* Streams and lakes with anadromous or adfluvial fish habitat; or high quality resident fish waters listed in Appendix 68.1, Region 10 Aquatic Habitat management Handbook (FSH 2609.24), June 1986; or habitat above fish migration barriers known to be reasonable enhancement opportunities for anadromous fish.

*Class II:* Streams and lakes with resident fish populations and generally steep (6-15 percent) gradient (can also include streams from 0-5 percent gradient) where no anadromous fish occur, and otherwise not meeting Class I criteria. These populations have limited fisheries values and generally occur upstream of migration barriers or have other habitat features that preclude anadromous fish use.

*Class III:* Perennial and intermittent streams with no fish populations but which have sufficient flow or transport sufficient sediment and debris to have an immediate influence on downstream water quality or fish habitat capability. These streams generally have bankfull widths greater than 5 feet and are highly incised into the surrounding hillslope.

*Class IV:* Intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams generally are shallowly incised into the surrounding hillslope.



## 5 Glossary

*Non-streams:* Rills and other watercourses, generally intermittent and less than 1 foot in bankfull width, little or no incisement into the surrounding hillslope, and with little or no evidence of scour.

### **Beach Fringe Habitat**

Habitat that occurs from the intertidal zone inland 1,000 feet, and islands of less than 50 acres.

### **Bedload**

Sand, silt, and gravel, or soil and rock debris rolled along the bottom of a stream by the moving water.

### **Best Management Practice (BMP)**

Practices used for the protection of water quality. BMPs are designed to prevent or reduce the amount of pollution from nonpoint sources or other adverse water quality impacts while meeting other goals and objectives. BMPs are standards to be achieved, not detailed or site-specific prescriptions or solutions. As defined in the USDA Forest Service's Soil and Water Conservation Handbook, BMPs are mandated for use in Region 10 under the Tongass Timber Reform Act.

### **Biological Diversity (Biodiversity)**

The variety of life in all its forms and at all levels. This includes the various kinds and combinations of: genes; species of plants, animals, and microorganisms; populations; communities; and ecosystems. It also includes the physical and ecological processes that allow all levels to interact and survive. The most familiar level of biological diversity is at the species level, which is the number and abundance of plants, animals, and microorganisms.

### **Blowdown**

See Windthrow.

### **Board Foot**

A unit of wood measuring 12 inches by 12 inches by 1 inch (12"x12"x1"). One acre of commercial timber in Southeast Alaska yields on the average 18,000 to 34,000 board feet per acre (ranging from 8,000 to 90,000 board feet per acre). One million board feet (MMBF) would be the volume of wood covering one acre two feet thick. One MMBF yields approximately enough timber to build 120 houses.

### **Bog**

An undrained or imperfectly drained area with a vegetation complex composed of sedges, shrubs, and sphagnum mosses, typically with peat formation. See also Muskeg.

### **Braided Streams or Channels**

A stream flowing in several dividing and reuniting channels resembling the strands of a braid, the cause of division being the obstruction by sediment deposited by the stream.

### **Buffer**

An area around a resource where timber harvest is restricted or prohibited. For example, the Tongass Timber Reform Act requires that timber harvest be prohibited in an area no less than 100 feet from each side of all Class I streams and Class II streams which flow directly into Class I streams. This 100-foot area is known as a "stream buffer".

### **Canopy**

See Overstory.

## **Carrying Capacity**

The maximum number of species that can be supported indefinitely by available resources in a given area.

## **Class I, II, III, IV, and Non-streams**

See Aquatic Habitat Management Units.

## **Clearcut**

The harvesting in one cut of all trees on an area. The area harvested may be a patch, strip, or stand large enough to be mapped or recorded as a separate class in planning for sustained yield. Clearcut size on the Tongass National Forest is limited to 100 acres, except for specific conditions noted in the Alaska Regional Guide.

## **Commercial Forest Land (CFL)**

Productive forest land that is producing or capable of producing continuous crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet per acre of annual growth or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

*Normal CFL:* Timber that can be economically harvested with locally available logging systems. Composed of two categories:

*Standard:* Timber that can be economically harvested with locally available logging systems, such as highlead or short-span skyline.

*Special:* Timber that is in areas where special consideration is needed to protect other resources but can be harvested with locally available logging systems.

*Non-standard CFL:* Timber that cannot be harvested with locally available logging systems and would require the use of other logging systems such as helicopter or long-span skyline.

## **Commercial Thinning**

Thinning a stand where the trees to be removed are large enough to sell.

## **Confluence**

The point where two streams meet.

## **Connectivity**

A measure of the extent that forest areas between or outside reserves provide habitat for breeding, feeding, dispersal, and movement.

## **Corridor**

Connective links of certain types of vegetation between patches of suitable habitat which are necessary for certain species to facilitate movement of individuals between patches of suitable habitat. Also refers to transportation or utility right-of-way.

## **Cruise**

Refers to the general activity of determining timber volume and quality, as opposed to a specific method.

## **Cultural Resources**

See Heritage Resources.

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### **Cumulative Effects**

The impacts on the environment resulting from the addition of the incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions occurring over time.

### **Debris Avalanche**

The sudden movement downslope of the soil mantle; it occurs on steep slopes and is caused by the complete saturation of the soil from prolonged heavy rains.

### **Debris Flow**

A general term for all types of rapid movement of debris downslope.

### **Debris Torrents**

Landslides that occur as a result of debris; avalanche materials which either dam a channel temporarily or accumulate behind temporary obstructions such as logs and forest debris.

### **Deer Winter Range**

Locations that provide food and shelter for Sitka black-tailed deer under moderate to severe winter conditions. Usually associated with high volume old-growth forest at low elevations and south aspects.

### **Developed Recreation**

Recreation that requires facilities that, in turn, result in concentrated use of an area, such as campgrounds and ski areas. Facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. See also Dispersed Recreation.

### **Diameter at Breast Height (DBH)**

The diameter of a tree measured 4 feet 6 inches from the ground.

### **Direct Employment**

The jobs that are immediately associated with a timber sale, including logging, sawmills, and pulp mills.

### **Dispersed Recreation**

Recreational activities that are not confined to a specific place and are generally outside developed recreation sites. This includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments. See also Developed recreation.

### **Distance Zone**

Areas of landscapes denoted by specified distances from the observer (foreground, middleground, or background). Used as a frame of reference in which to discuss landscape characteristics or management activities.

### **Diversity**

The distribution and abundance of different plant and animal communities and species within an area.

### **Draft Environmental Impact Statement (DEIS or Draft EIS)**

A statement of environmental effects for a major Federal action which is released to the public and other agencies for comment and review prior to a final management decision. Required by Section 102 of the National Environmental Policy Act (NEPA).



**Ecosystem**

A community of organisms and its physical setting. An ecosystem, whether a fallen log or an entire watershed, includes resident organisms, non-living components such as soil nutrients, inputs such as rainfall, and outputs such as organisms that disperse to other ecosystems.

**Effects**

Effects may be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, or social and may be direct, indirect, or cumulative.

*Direct Effects:* Results of an action occurring when and where the action takes place.

*Indirect Effects:* Results of an action occurring at a location other than where the action takes place and/or later in time, but in the reasonably foreseeable future.

*Cumulative Effects:* See Cumulative Effects

**Endangered Species**

A species of plant or animal which is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act (ESA). See also Threatened Species, Sensitive Species.

**Erosion**

The wearing away of the land surface by running water, wind, ice, gravity, or other geological activities.

**Escapement**

Adult anadromous fish that escape from all causes of mortality (human-caused or natural) to return to streams to spawn.

**Estuary**

For the purpose of this EIS process, estuary refers to the relatively flat intertidal and upland areas generally found at the heads of bays and mouths of streams. They are predominantly mud and grass flats and are unforested except for scattered spruce or cottonwood.

**Even-aged Stand Management**

Management that results in the creation of stands in which trees of essentially the same age grow together. Clearcut, shelterwood, and other tree-cutting methods produce even-aged stands. See also Uneven-aged Management.

**Executive Order**

An order issued by the President of the United States that has the force of law.

**Falldown**

The difference between planned or scheduled harvest and that which is attained after implementation.

**Final Environmental Impact Statement (FEIS or Final EIS)**

The final version of the statement of environmental effects required for major federal actions under Section 102 of the National Environmental Policy Act. It is a revision of the Draft EIS in response to public and agency comments. The decisionmaker chooses

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which alternative to select from the Final EIS, and subsequently issues a Record of Decision (ROD).

### **Floodplain**

The lowland and relatively flat areas joining inland and coastal waters including debris cones and flood-prone areas of offshore islands; generally including that area subject to a 1 percent (100-year recurrence) or greater chance of flooding in any given year.

### **Forb**

Any herbaceous plant that is not a grass or grass-like. Includes plants that are commonly called weeds or wildflowers.

### **Forest Land**

Lands currently supporting or capable of supporting forests at a density of 10 percent crown closure or better. Includes all areas with forest cover, including old growth and second growth, and both commercial and noncommercial forest land.

### **Forest Plan**

The Tongass Land Management Revision signed in 1997. This is the 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning, the daily uses, and the activities carried out within the forest.

### **Forested Habitat**

All areas with forest cover. Used in this EIS to represent a general habitat zone.

### **Forested Wetland**

A wetland whose vegetation is characterized by an overstory of trees that are 20 feet or taller.

### **Fragmentation**

An element of biological diversity that describes the natural condition of habitats in terms of the size of discrete habitat blocks or patches, their distribution, the extent to which they are interconnected, and the effects of management on these natural conditions. Also the process of reducing the size and connectivity of stands within a forest.

### **Geographic Information System (GIS)**

An information processing technology to input, store, manipulate, analyze, and display spatial and attribute data to support the decision-making process. It is a system of computer maps with corresponding site-specific information that can be electronically combined to provide reports and maps.

### **Group Selection**

Small groups of trees up to 2 acres in size are harvested.

### **Habitat**

The sum total of environmental conditions of a specific place that is occupied by an organism, population, or community of plants or animals.

### **Habitat Capability**

An estimate of the number of healthy individuals of a species that a habitat can sustain.

### **Habitat Suitability Index (HSI)**

A value assigned to a unit of land using a computerized model that relates vegetative and geographic characteristics (e.g., stand volume, proximity to a stream or cliff, slope, aspect, etc.) to the land unit's value for a particular wildlife species. Values range from 0

to 1, with 1 being the best. Habitat Capability Models (HCM) used to generate HSIs were developed by interagency teams of biologists using the best available information including research results and best professional judgment.

## **Heritage Resources**

Also known as Cultural Resources. Historic or prehistoric objects, sites, buildings, structures, and their remains, resulting from past human activities.

## **Important Subsistence Use Area**

Important Subsistence Use Areas include the “most-reliable” and “most often hunted” categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

## **Indirect Employment**

The jobs in service industries that are associated with a timber sale, including suppliers of logging and milling equipment. See also Direct Employment.

## **Infrastructure**

The facilities, utilities, and transportation systems needed to meet public and administrative needs.

## **Inoperable Timber**

Timber that cannot be harvested by any proven method because of potential resource damage, extremely adverse economic considerations, or physical limitation.

## **Interdisciplinary Team (IDT)**

A group of people with different backgrounds assembled to research, analyze, and write a project EIS. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze a proposed action and its alternatives.

## **Irretrievable Commitments**

Loss of production or use of renewable natural resources for a period of time. For example, timber production from an area is irretrievably lost during the time an area is allocated to a no-harvest prescription; if the allocation is changed to allow timber harvest, timber production can be resumed. The production lost is irretrievable, but not irreversible.

## **Irreversible Commitments**

Decisions causing changes that cannot be reversed. For example, if a roadless area is allocated to allow timber harvest, and timber is actually harvested, that area cannot at a later time be allocated to wilderness. Once harvested, the ability of the area to meet wilderness criteria has been irreversibly lost. Often applies to nonrenewable resources such as minerals and cultural resources.

## **Issue**

A point, matter, or section of public discussion of interest to be addressed or decided.

## **Karst**

A type of topography that develops in areas underlain by soluble rocks, primarily limestones. Sinkholes, collapsed channels, vertical shafts, and caves are formed when the subsurface layer dissolves. Areas on which karst has developed are said to display “karst topography.”



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### **Landscape-level Diversity**

A function of the spatial distribution of habitat types across a large area such as a Project Area or ecological province.

### **Landslides**

The moderately rapid to rapid downslope movement of soil and rock materials that may or may not be water-saturated.

### **Land Use Designation (LUD)**

A defined area of land specific to which management direction is applied by the Forest Plan.

### **Large Woody Debris (LWD)**

Any large piece of relatively stable woody material having a diameter greater than 10 centimeters and a length greater than one meter that intrudes into the stream channel.

### **Logging Camp**

A temporary facility established to house industry and Forest Service personnel while timber harvest occurs in the area.

### **Log Transfer Facility (LTF)**

A facility that is used for transferring commercially harvested logs to and from a vessel or log raft or the formation of a log raft. It is wholly or partially constructed in waters of the United States and siting and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed "terminal transfer facility."

### **MBF**

A thousand board feet of net sawlog and utility volume.

### **MMBF**

A million board feet of net sawlog and utility volume.

### **Management Indicator Species (MIS)**

Species that are used to monitor the effects of planned management activities on viable populations of fish and wildlife during a planning process. The population changes of these species are believed to best indicate the effects of land management.

### **Management Prescriptions**

Management practices and intensity selected and scheduled for application on a specific area (e.g., a land use designation) to attain multiple-use and other goals and objectives.

### **Maritime Climate**

Weather conditions controlled by an oceanic environment characterized by small annual temperature ranges and high precipitation.

### **Market Pond Value**

Also known as pond log value. Selling value minus manufacturing costs. Pond log values are the price a timber buyer would pay for a log at the mill site.

### **Mass Movement**

The downslope movement of a block or mass of soil. This usually occurs under conditions of high-soil moisture and does not include individual soil particles displaced as surface erosion.

**Mass Movement Index (MMI)**

Rating used to group soil map units that have similar properties with respect to the stability of natural slopes. It includes the following: MMI1 = Low potential for mass movement; MMI2 = Moderate potential for mass movement; MMI3 = High potential for mass movement; and MMI4 = Very high potential for mass movement.

**Memorandum of Understanding (MOU)**

A legal agreement between the Forest Service and other agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A MOU is not a fund obligating document.

**Mineral Soils**

Soils consisting predominantly of, and having its properties determined by, mineral matter.

**Minerotrophic Sites**

True fens that receive water which passes through mineral soil. These areas generally have a high groundwater level and occupy a low point of relief in a basin.

**Mitigation**

Measures designed to counteract environmental impacts or to make impacts less severe. These measures may include avoiding an impact by not taking a certain action or part of an action, minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

**Mixed Conifer**

In Southeast Alaska, mixed conifer stands usually consist of western hemlock, mountain hemlock, Alaska yellow-cedar, Western redcedar, and Sitka spruce species. Shorepine may occasionally be present.

**Monitoring**

A process of collecting information to evaluate whether or not objectives of a project and its mitigation plan are being realized. Monitoring can occur at different levels: to confirm whether mitigation measures were carried out in the matter called for (Implementation Monitoring); to confirm whether mitigation measures were effective (Effectiveness Monitoring); or, to validate whether overall goals and objectives were appropriate (Validation Monitoring). Different levels call for different methods of monitoring.

**Multiple-aged Stands**

An intermediate form of stand structure between even and uneven-aged stands. These stands generally have two or three distinct tree canopy levels occurring within a single stand.

**Multiple Entry**

More than one stand or land treatment activity during a rotation of a stand or area.

**Muskeg**

In Southeast Alaska, a type of bog or fen that has developed over thousands of years in depressions or flat areas on gentle to steep slopes. Also called peatlands.

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### **National Environmental Policy Act (NEPA)**

An act, passed by Congress in 1969, that declared a national policy to encourage productive harmony between humans and their environment to promote efforts that will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of humans to enrich the understanding of the ecological systems and natural resources important to the nation and to establish a Council on Environmental Quality. This act requires the preparation of environmental impact statements for federal actions that are determined to be of major significance.

### **National Forest Management Act (NFMA)**

A law passed in 1976 that amends the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of forest plans, regional guides, and regulations to guide that development.

### **National Wild and Scenic River System**

Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act of 1968 and amended in 1986, for preservation of their free-flowing condition. May be classified and administered under one or more of the following categories: Wild, Scenic, and/or Recreational.

### **Net Sawlog Volume**

Trees suitable in size and quality for producing logs that can be processed into lumber. In Southeast Alaska, depending on the market, the volume may be processed as pulp or lumber.

### **No Action Alternative**

The most likely condition expected to exist in the future if current management direction were to continue unchanged.

### **Noncommercial Forest Land**

Land with more than 10 percent cover of commercial forest tree species but not qualifying as commercial forest land (CFL).

### **Non-interchangeable Components (NIC's)**

Increments of the suitable land base and their contribution to the allowable sale quantity (ASQ) that are established to meet Forest Plan objectives. NIC's are identified as parcels of land and the type of timber thereon which are differentiated for the purpose of Forest Plan implementation. The total ASQ is derived from the sum of the timber volumes for all NIC's. The NIC's cannot be substituted for each other in the timber sale program.

*NIC I. Normal Operability:* This is volume scheduled from suitable lands using existing logging systems. Most of these lands are expected to be economic under projected market conditions. On average, sales from these lands have the highest probability of offering a reasonable opportunity for a purchases to gain a profit from his/her investment and labor. This is the best operable ground.

*NIC II. Difficult and Isolated Operability:* This is volume scheduled from suitable lands that are available for harvest using logging systems not in common use in Southeast Alaska. Most of these lands are presently considered economically and technologically marginal. Difficult operability would include helicopter yarding distances greater than three-quarters of a mile. Isolated operability stands are extremely difficult and costly to harvest, due to terrain or helicopter yarding distances greater than one mile.



**Old-growth Forest**

Ecosystems distinguished by the later stages of forest stand development that differs significantly from younger forests in structure, ecological function, and species composition. Old-growth forest is characterized by a patchy, multi-layered canopy; trees that represent many age classes; large trees that dominate the overstory, large standing dead (snags) or decadent trees; and higher accumulations of large down woody material. The structure and function of an old-growth ecosystem will be influenced by its stand size and landscape position and context.

**Organic Soils**

Soils that contain a high percentage (generally greater than 20 to 30 percent) of organic matter throughout the soil depth.

**Overstory**

The portion of trees in a forest that forms the uppermost layer of foliage, usually formed by the tallest trees. Also called the canopy.

**Partial Cutting**

Method of harvesting trees (not clearcutting) where any number of live stems are left standing in any of various spatial patterns. Can include seed tree, shelterwood, or other methods.

**Patch**

A non-linear surface area differing in appearance from its surroundings.

**Planning Record**

A detailed, formal system of records that document the planning process for an EIS. The record contains data, maps, reports, planning process information, and results of public participation in the planning process. The Planning Record documents the decisions and activities that resulted in the Final EIS and ROD.

**Plant Communities**

Aggregations of living plants having mutual relationships among themselves and to their environment.

**Pond Value**

The delivered price of logs at the mill minus the cost to manufacture them into usable products.

**Population Viability**

Ability of a population to sustain itself over time. See viable population.

**Precommercial Thinning**

The practice of removing some of the trees of less than marketable size from a stand in order to achieve various management objectives.

**Process Group**

A combination of similar stream channel types based on major differences in landform, gradient, and channel shapes.

**Productive Old Growth (POG)**

Old-growth forest capable of producing at least 20 cubic feet of wood fiber per acre per year, or having greater than 8,000 board feet per acre.

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### **Public Participation**

Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service activities.

### **Record of Decision (ROD)**

A document separate from but associated with an EIS that states the decision, identifies all alternatives, specifying which were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternatives have been adopted, and if not, why not.

### **Recreation Opportunity Spectrum (ROS)**

The system for planning and managing recreation resources that categorizes recreation opportunities into six classes. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skill needed to enjoy the area, and the relative density of recreation use. The classes are:

*Primitive:* An essentially unmodified natural environment of fairly large size. Interaction between users is very low, and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use is generally not permitted.

*Semi-Primitive Nonmotorized:* A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Use of local roads for recreational purposes is not allowed.

*Semi-Primitive Motorized:* A natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Local roads used for other resource management activities may be present.

*Roaded Natural:* A natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high with evidence of other users prevalent. Motorized use is allowed.

*Roaded Modified:* A natural environment that has been substantially modified particularly by vegetation manipulation. There is strong evidence of roads and/or highways. Frequency of contact is low to moderate.

*Rural:* A natural environment that has been substantially modified by development of structures and vegetative manipulation. Structures are readily apparent and may range from scattered to small dominant clusters. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.

### **Reforestation**

The natural or artificial restocking of an area with trees.

### **Regeneration**

The process of establishing a new crop of trees on previously harvested land.

**Regional Guide**

The guide developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended. It guides all natural resource management activities and establishes management standards and guidelines for the National Forest System lands within a given region.

**Rehabilitation**

Actions taken to protect or enhance site productivity, water quality, or other values for a short period of time.

**Reserve Trees**

Merchantable or submerchantable trees and snags that are left within the harvest unit to provide biological habitat components over the next management cycle.

**Resident Fish**

Fish that are not anadromous and that reside in fresh water on a permanent basis. Resident fish include non-anadromous Dolly Varden char and cutthroat trout.

**Resource Values**

The tangible and intangible worth of forest resources.

**Responsible Official**

The Forest Service employee who has the delegated authority to make a specific decision.

**Retention**

A visual quality objective which provides for management activities that are not visually evident to the casual observer. The term is also used to describe the trees retained in a stand after harvest.

**Revegetation**

The re-establishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of reforestation or reseeding.

**Riparian Ecosystems**

A transition between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water.

**Riparian Management Area**

Land areas delineated in the Forest Plan to provide for the management of riparian resources. Specific standards and guidelines, by stream process group, are associated with riparian management areas. Riparian management areas may be modified by watershed analysis.

**Road Maintenance Level**

The level of service provided by, and maintenance required for, a specific road consistent with road management objectives and maintenance criteria (FSH 7709.58, Section 12.3).

*Maintenance Level 1:* Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed.



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*Maintenance Level 2:* Assigned to roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration.

*Maintenance Level 3:* Assigned to roads open and maintained for travel by the prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.

*Maintenance Level 4:* Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.

*Maintenance Level 5:* Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-laned and paved, or aggregate surfaced with dust abatement.

### **Road Management Objective (RMO)**

Defines the intended purpose of an individual road based on Management Area direction and access management objectives. RMOs contain design criteria, operation criteria, and maintenance criteria. Long-term and short-term roads have RMOs.

### **Roads**

*Specified:* Roads usually developed and operated for long-term land and resource management purposes to constant service.

*Temporary:* For National Forest timber sales, temporary roads are constructed to harvest timber on a one-time basis. These logging roads are not considered part of the permanent Forest transportation network and have stream crossing structures removed, erosion measures put into place, and the road closed to vehicular traffic after harvest is completed.

### **Roadless Area**

An area of undeveloped public land identified in the roadless area inventory of the 1997 TLMP within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use.

### **Rotation**

The planned number of years (approximately 100 years in Alaska) between the time that a forest stand is regenerated and its next cutting at a specified stage of maturity.

### **Sawlog**

That portion of a tree that is suitable in size and quality for the production of dimension lumber, collectively known as sawtimber.

### **Scheduled Timber Harvests**

Timber harvests done as part of meeting the allowable sale quantity.

### **Scoping Process**

Early and open activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate. Scoping focuses on the issues surrounding the proposed action and the range of actions, alternatives, and impacts to be considered in an EA or an EIS.

### **Scrub-Shrub Wetland**

Wetland dominated by woody vegetation less than 20 feet tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of

environmental conditions. In Southeast Alaska, this includes forested lands where trees are stunted because of poor soil drainage.

**Second-growth Forest**

Forest growth that has become established following some disturbance such as cutting, serious fire, or insect attack; even-aged stands that will grow back on a site after removal of the previous timber stand.

**Sediment**

Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by streams, mass movement, glaciers, or wind and has come to rest on the earth's surface.

**Seedling/Sapling Stage**

The stage following timber harvest when most of the colonizing tree and shrub seedlings become established. Usually 1 to 25 years.

**Selective Cutting**

The annual or periodic removal of trees (particularly mature trees), individually or in small groups from an uneven-aged forest to realize the yield and establish a new crop of irregular constitution.

**Sensitive Species**

Plant and animal species which are susceptible or vulnerable to activity impacts or habitat alterations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species, that are on a nonofficial State list, or that are recognized by the regional forester as needing special management on National Forest System lands to prevent placement on Federal or State lists.

**Shade Tolerance**

Tree species that have physiological growth processes adapted to shaded environments. Western hemlock is a shade tolerant species. Other tree species tolerance to shade may range from tolerant to intolerant.

**Significant**

Specific legal term under the National Environmental Policy Act (NEPA) that requires considerations of both context and intensity in evaluating impacts.

**Silvicultural Prescription**

A written technical document which provides detailed implementation direction about methods, techniques, timing, and monitoring or vegetative treatments. A prescription is prepared after a preferred treatment alternative has been selected, but before the project is implemented. A prescription is prepared by a silviculturist who uses interdisciplinary input to best achieve established objectives, direction, and requirements for land managed by the USDA Forest Service.

**Silviculture**

The art, science and practice of controlling the establishment, composition, structure and growth of trees and other vegetation in forest stands.

**Site Index**

A measure of the relative productive capacity for tree growth of an area. Measurement of site index is based on height of dominant trees in a stand at a given age.

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### **Site Productivity**

Production capability of specific areas of land.

### **Slash**

Debris left over after a logging operation (i.e., limbs, bark, broken pieces of logs).

### **Smolt**

A juvenile salmon, trout, or Dolly Varden migrating to the ocean and undergoing physiological changes to adapt its body from a freshwater to a saltwater environment.

### **Snag**

A standing dead tree, usually greater than 5 feet tall and 6 inches in diameter at breast height.

### **Soil Productivity**

Capacity of soil to produce plant growth due to the chemical, physical, and biological properties of the soil.

### **Spawning Area**

The available area in a stream course which is suitable for the deposition and incubation of salmon or trout eggs.

### **Split Yarding**

The process of separating the direction of timber harvest yarding into opposite directions.

### **Stand (Tree Stand)**

A group of trees occupying a specific area and sufficiently uniform in composition, age arrangement, and condition as to be distinguishable from the forest in adjoining areas.

### **Stand-level Diversity**

The diversity within specific habitats or limited land areas as measured by number of species present (species richness) or structural complexity of a given habitat type.

### **State Historic Preservation Officer (SHPO)**

State appointed official who administers Federal and State programs for cultural resources.

### **Stocking**

The degree of occupancy of land by trees as measured by basal area or number of trees and as compared to a stocking standard; that is, the basal area or number of trees required to fully use the growth potential of the land.

### **Stream Classes**

See Aquatic Habitat Management Unit.

### **Structural Diversity**

The diversity of forest structure, both vertically and horizontally, which provides for variety of forest habitats such as logs and multi-layered forest canopy for plants and animals.

### **Stumpage**

The value of timber as it stands uncut in terms of dollar value per thousand board feet.

### **Subsistence Use**

The customary and traditional uses by rural Alaskan residents of wild renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools.



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or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing, for personal or family consumption; and for customary trade.

### **Subsistence Use Area**

Important Subsistence use areas include the "most reliable" and "most often hunted" categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

### **Substantive Comment**

A public comment that provides factual information, professional opinion, or informed judgment germane to the action being proposed.

### **Succession**

The ecological progression of community change over time, characterized by displacements of species leading to a relatively stable climax community.

### **Suitability**

An evaluation based upon a resource's potential use within proposed management activities.

### **Suitable Forestland**

Commercial forestland identified as having both the biological capability and availability to produce industrial wood products.

### **Sustained Yield**

The amount of renewable resources that can be produced continuously at a given intensity of management.

### **Temporary Roads**

See Roads.

### **Tentatively Suitable Forestland**

Forest land that is producing or is capable of producing crops of industrial wood and (a) has not been withdrawn by Congress, the Secretary of Agriculture or the Chief of the Forest Service; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity or watershed conditions; (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within 5 years after final harvest; and (d) adequate information is available to project responses to timber management activities.

### **Thinning**

The practice of removing some of the trees in a stand so that the remaining trees will grow faster due to reduced competition for nutrients, water, and sunlight. Thinning may also be done to change the characteristics of a stand for wildlife or other purposes. Thinning may be done at two different stages: precommercial and commercial.

### **Threatened Species**

A species of plant or animal likely to become endangered within the foreseeable future throughout all or a significant portion of its range, as defined in the Endangered Species Act of 1973, and which has been designated in the Federal Register by the Secretary of the Interior as a threatened species. See also Endangered Species, Sensitive Species.

## 5 Glossary

### **Tiering**

Eliminating repetitive discussion of the same issue by incorporating by reference. The general discussion in an EIS of broader scope (e.g., this document is tiered to TLMP, as amended).

### **Timber Appraisal**

Establishing the fair market value of timber by taking the selling value minus manufacturing costs, the cost of getting logs from the stump to the manufacturer, and an allowance for profit and risk.

### **Timber Classification**

Forested land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classification used for this purpose:

*Nonforest:* Land that has never supported forests and land formerly forested where use for timber production is precluded by development for other uses.

*Forest:* Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

*Suitable or suitable available:* Land to be managed for timber production on a regulated basis.

*Unsuitable:* Forest land withdrawn from timber utilization by statute or administrative regulation (for example, wilderness), or identified as inappropriate for timber production in the Forest planning process.

*Commercial forest:* Forest land tentatively suitable for the production of continuous crops of timber and that has not been withdrawn.

### **Timber Entry**

A term used to refer to how far into the timber rotation an area is on the basis of acreage harvested. For example, if an area is being managed for 3 entries over a 100-year rotation, the first entry would be completed when one-third (approximately 33 percent) of the available acreage is harvested (usually in 30-40 years); the second entry would be completed when two-thirds (approximately 66 percent) of the available acreage is harvested (usually 60-70 years); the third entry would be completed when all of the available acreage is harvested (at the end of the rotation).

### **Timber Harvest Unit**

An area within which Forest Service specifies for harvest all or part of the timber.

### **Tongass Land Management Plan (TLMP)**

The 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning and the daily uses and activities carried out within the forest signed in 1997. See Forest Plan.

### **Tongass Resource Use Cooperative Survey (TRUCS)**

A compilation of data on subsistence uses for evaluating the effects of the proposed action in this EIS.

**Traffic Service Levels**

Traffic characteristics and operating conditions that are used in setting road maintenance levels.

**Understory**

The trees and shrubs in a forest growing under the main crown canopy or overstory.

**Uneven-aged Management**

The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular size to retain within each area, thereby maintaining a planned distribution of size classes.

**Unsuitable**

Forest land withdrawn from timber utilization by statute or administrative regulation (e.g., wilderness), or identified as not appropriate for timber production in the forest planning process.

**Utility Logs**

Those logs that do not meet sawlog grade but are suitable for production of firm usable pulp chips.

**Value Comparison Unit (VCU)**

Areas which generally encompass a drainage basin containing one or more large stream systems; boundaries usually follow easily recognizable watershed divides. Established to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

**Viable Population**

The number of individuals in a species required to ensure the continued long-term existence of the population in natural, self-sustaining populations and adequately distributed throughout the region.

**Viewshed**

An expansive landscape or panoramic vista seen from a road, marine waterway, or specific viewpoint.

**Visual Absorption Capability (VAC)**

An estimate of the relative ability of a landscape to absorb alteration yet retain its visual integrity.

**Visual Quality Objective (VQO)**

Measurable standards reflecting five different degrees of landscape alteration based upon a landscape's diversity of natural features and the public's concern for high scenic quality. The five categories of VQOs are:

*Preservation:* Permits ecological changes only. Applies to wilderness areas and other special classified areas.

*Retention:* Provides for management activities that are not visually evident; requires reduction of contrast through mitigation measures either during or immediately after operation.



## 5 Glossary

*Partial Retention:* Management activities remain visually subordinate to the natural landscape. Mitigation measures should be accomplished within one year of project completion.

*Modification:* Management activities may visually dominate the characteristics landscape. However activities must borrow from naturally established form line color and texture so that its visual characteristics resemble natural occurrences within the surrounding area when viewed in the middleground distance.

*Maximum Modification:* Management activities may dominate the landscape. Mitigation measures should be accomplished within five years of project completion.

### **V-notch**

A deeply cut valley along some waterways, generally in steep, mountainous terrain, that would look like a "V" from a frontal view.

### **Volume**

Stand volume based on standing net board feet per acre by Scribner Rule.

### **Volume Strata**

Divisions of old-growth timber volume derived from the interpreted timber type data layer (TIMTYP) and the common land unit data layer (CLU). Three volume strata (low, medium, and high) are recognized in the Forest Plan for each Administrative Area.

### **Watershed**

That area that contributes water to a drainage or stream; portion of a forest in which all surface water drains to a common point. Can range from a few tens of acres that drain a single small intermittent stream to many thousands of acres for a stream that drains hundreds of connected intermittent and perennial streams.

### **Wetland**

Areas that are inundated by surface or groundwater frequently enough to support vegetation that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mudflats, and natural ponds.

### **Wildlife Analysis Area (WAA)**

Alaska Department of Fish and Game (ADF&G) administrative designation of an area that includes one or several Value Comparison Units (VCUs) for wildlife analysis and regulating wildlife populations.

### **Windfirm**

Configuration of harvest units so as not to create an opening which exposes the adjacent stand of timber to the direction of the major prevailing storm wind (southeast).

### **Windthrow**

The act of trees being uprooted, blown down, or broken off by storm winds. Three types of windthrow include: endemic where individual trees are blown over, catastrophic where a major windstorm can destroy hundreds of acres, and management related where the clearing of trees in an area makes the adjacent standing trees vulnerable to windthrow.

### **Yarding**

Hauling timber from the stump to a collection point.

# CHAPTER 6

## DISTRIBUTION LIST





# CHAPTER 6

## DISTRIBUTION LIST

### FEDERAL AGENCIES

Alaska Area Region, NPS, Anchorage, AK  
Advisory Council on History, Washington, DC  
The Center for Biological Diversity, Idyllwild, CA  
Federal Aviation Administration, Anchorage, AK  
Federal Highway Administration, San Francisco, CA  
Federal Railroad Administration, Washington, DC  
National Marine Fisheries Service, Juneau, AK  
National Park Service, Rivers & Trails, Anchorage, AK  
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US House of Representatives, Washington, DC  
US Navy, Washington, DC  
US Naval Observatory, Washington, DC  
US Senate, Anchorage, AK  
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USDI, Fish & Wildlife Service, Juneau, AK  
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## 6 Distribution List

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## Distribution List **6**

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# **APPENDIX A**

## **REASONS FOR SCHEDULING THE ENVIRONMENTAL ANALYSIS OF THE MADAN TIMBER SALE PROJECT**

# APPENDIX A

THE FOLLOWING TABLES  
CONTAIN THE DATA  
FOR THE STUDY

# Appendix A

## Reasons for Scheduling the Environmental Analysis of Madan Project Area Timber Sale

### Introduction

This Appendix provides a detailed explanation of the rationale for a specific timber sale project and its importance to the multi-year timber program on the Tongass National Forest. To accomplish this, the following questions are answered:

- Why is timber from the Tongass National Forest being offered for sale?
- What steps must be completed to prepare a sale for offer?
- How does the Forest Service develop expectations about the market demand for timber?
- How does the Forest Service maintain an orderly and predictable timber sale program?
- How does the Forest Service decide where timber sale projects should be located?
- How does this project fit into the Tongass timber program?
- Why can't this project be located somewhere else?

Coordinated timber sale planning is essential for meeting the goals of the Tongass Land Management Plan and to provide an orderly flow of timber to local industry. To determine the volume of timber to offer each year, the Forest Service can look to current market conditions and the level of industry operations. However, the lengthy planning process, of which this document is a part, requires the Forest Service to rely on projections of future harvest levels to decide how many timber sale projects to begin each year. This document explains how the Forest Service uses information about future markets and past experience with the logistics of timber sale planning to determine the volume of timber that needs to be started through this process each year. Using a detailed timber sale schedule that provides information about each sale as it moves through each stage of the planning process, this Appendix explains the rationale and the necessity for completing this particular timber sale project at this point in time.

### Why is Timber from the Tongass National Forest Being Offered for Sale?

#### *National Legislation*

On a national level, the legislative record is very clear about the role of the timber program in the multiple-use mandate of the national forests. The Organic Act of 1897,



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16 USC 473-481 (partially repealed in 1976) directed the agency to manage the forests in order to "improve and protect the forest ... [and] for the purpose of securing favorable conditions of water flows, and to *furnish a continuous supply of timber* for the use and necessities of the citizens of the United States" (emphasis added.) The Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. 528-531, directs the Forest Service to administer federal lands for "outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

The National Forest Management Act of 1976 (16 U.S.C. 472a) states that "the Secretary of Agriculture...[may sell, at not less than appraised value, trees, portions of trees, or forest products located on National Forest System Lands]." Although the heart of the Act is land management planning, the Act also sets policy direction for timber management and public participation in Forest Service decision making. Under NFMA, the Forest Service was directed to "limit the sale of timber from each national forest to a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis" (16 U.S.C. 1611).

The NFMA directed the Forest Service to complete land management plans for all units of the National Forest System. Forest Plans were to be developed by an interdisciplinary team to provide for the coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness.

### ***Alaska-Specific Legislation***

Legislation unique to Alaska also directs the Forest Service to maintain a commercial timber program. The Alaska National Interest Lands Conservation Act (ANILCA; P.L. 96-487, 1980) and the Tongass Timber Reform Act (TTRA; P.L. 101-625, 1990) speak directly to the issue of Tongass timber supply. Section 705(a) of ANILCA directed the Forest Service to maintain a timber supply from the Tongass at a rate of 4.5 billion board feet per decade. To ensure that the timber target was met, Congress provided for a \$40 million annual earmark to fund pre-roading, cultural treatments and innovated logging systems.

Section 101 of TTRA repealed the timber supply mandate and fixed appropriations of ANILCA and replaced them with the following more general direction:

Sec. 705. (a), Subject to appropriations, other applicable law, and the requirements of the National Forest Management Act (P.L. 94-588); except as provided in subsection 9d) of this section, the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the annual market demand from such forest for each planning cycle.

Timber from the Tongass National Forest is being offered as part of the multiple use mission of the Forest Service as identified in public laws. Alaska-specific legislation and the Forest Plan directs the Forest Service to seek to provide timber to meet market demand subject to appropriations and balancing of forest uses.

### ***Tongass Forest Plan***

The 1979 *Tongass National Forest Land and Resource Management Plan* was the first Forest Plan to be completed. A revised Forest Plan was issued in 1997 and modified in 1999. Subsequently, Alaska Federal Court Judge James K. Singleton vacated the 1999 TLMP ROD in a March 30, 2001 court decision.

Alaska Federal Court Judge James K. Singleton also directed the Forest Service to Supplement the Revised Forest Plan FEIS to consider the wilderness values of Inventoried Roadless Areas. The Record of Decision for this Supplemental Environmental Impact Statement was signed in February 2003 and is consistent with the 1997 Record of Decision. The Roadless Area Conservation; Final Rule (Roadless Rule) was signed by the Secretary of Agriculture in January 2001. This rule generally established prohibitions on road construction, road reconstruction, and timber harvest in inventoried roadless areas on National Forest System lands. The rule prohibits logging and road building on nearly 60 million acres of lands, 9.3 million acres of which are within the Tongass National Forest.

Currently the Roadless Area Conservation Rule (Roadless Rule, January 12, 2001) is in effect and is the subject of a number of lawsuits. The Department of Agriculture and the Department of Justice have entered into an agreement with the state of Alaska (signed 6/10/03) settling the state's lawsuit challenging the applicability of the roadless rule in Alaska. The Department of Agriculture committed to publishing for comment a proposed amendment to the Roadless Rule that excludes the Tongass National Forest. Publication of this proposed amendment is scheduled for the end of June 2003 and includes a public comment period. The Department made no representation regarding the content or substance of any final amendment to the Roadless Rule that may result.

The Roadless Area Conservation Rule did contain exemption language for the Tongass National Forest. This language exempts projects for which the Draft EIS was published in the Federal Register prior to January 12, 2001 from the prohibitions of the rule. Several projects, including this one, will be offered that meet exemption criteria.

With regard to timber production, the Record of Decision for the 1997 Plan states: "The Tongass National Forest will continue timber harvest consistent with sustained yield and multiple use goals..." Although the maximum amount of timber that could be harvested during the first decade of the Revised Plan implementation is an average of 267 MMBF per year, a level of 200 MMBF or less is more likely to be offered over the next few years, given current market conditions and the transition that both the timber industry and the Forest Service is experiencing.

The timber resource will be managed for production of sawtimber and other wood products from timberlands available for sustainable timber harvest, on an even-flow, sustained-yield basis and in an economically efficient manner. We will seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber and the market demand for the planning cycle.

The Tongass National Forest will continue to allow timber harvest while maintaining sustained yield and multiple use goals. The forest-wide standards and guidelines for timber include general direction to "[e]nsure that silvicultural systems other than clearcutting are considered through an appropriate project level analysis process. However, uneven-aged management systems will be limited to areas where yarding equipment suited to selective logging can be used..."

Forest-wide, considering all land allocations where timber harvest is permitted, it is estimated that 65 percent of harvesting will involve clearcutting, with the remaining 35 percent utilizing other methods."

In the day to day operation of the Tongass timber program, the Forest Service attempts to strike a balance among timber availability as documented in the Forest Plan, the market demand for timber in Southeast Alaska, the needs and desires of other forest users, and funding allocations made by Congress.



### **What Steps Must Be Completed to Prepare a Sale for Offer?**

The timber sale program is complex. A number of projects are underway at any given point in time, each of which may be in a different stage of planning and preparation. A system of checkpoints, or "gates", helps the Forest Service track the significant milestones of each project from inception to contract termination. Each project passes through all of the following gates, with the complexity of the sale determining the complexity of the final product at each stage.

#### ***Gate 1 - Completion of Position Statement***

The Position Statement is a brief analysis of the project area with the intent of determining the feasibility of the potential timber sale. This is the first step in the timber sale planning process and it is usually completed from seven to ten years before a sale is offered. After the Position Statement is developed, the Forest Service decides whether to continue to the next phase of the project where a significant investment in time and money will be made.

#### ***Gate 2 – Sale Area Design, Environmental Documentation, and Decision***

This phase of the project is commonly referred to as the "NEPA" phase and includes inventory, public scoping, analysis, draft disclosure of the effects of the project on the environment, public comment, final analysis and disclosure, decision, potential appeal, and litigation. Gate 2 activities are generally completed two to six years before a sale is offered. The end product of this phase, an environmental decision document, forms the starting point for the next phase.

#### ***Gate 3 – Plan Implementation and Field Layout***

Gate 3 activities are typically completed one to three years before a sale is offered. During this phase, the information and direction included in the decision document (Gate 2) is used to designate the actual project on the ground. Additional site-specific information is collected at this time.

#### ***Gate 4 – Appraisal Offering Package***

The costs and value associated with the timber sale designed in Gate 3 are computed and packaged in a timber sale contract. The contract tells the prospective timber sale purchaser how the sale must be harvested to be in conformance to the project decision document. This phase of the Gate system occurs during the final year of the project development and culminates with the advertisement of the project for sale.

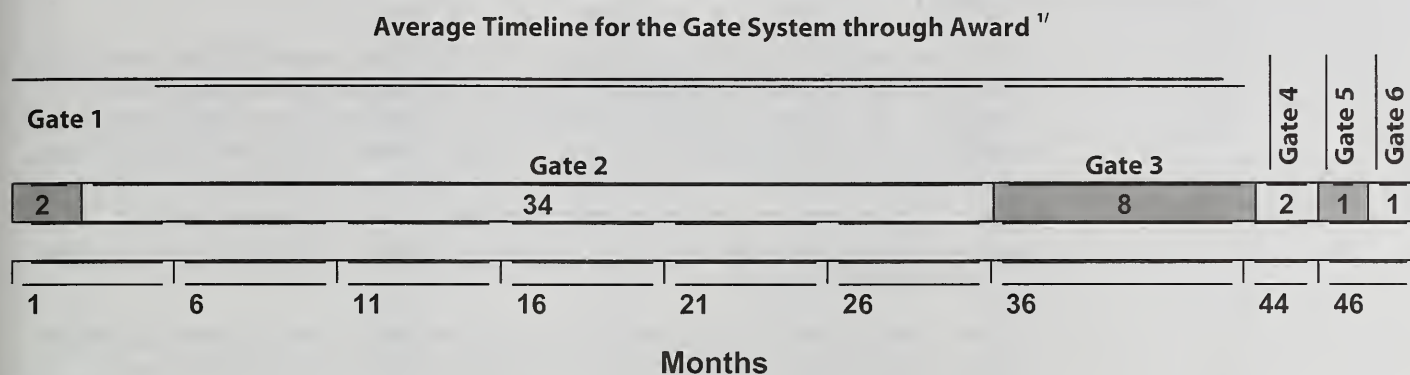
#### ***Gate 5 – Bid Opening***

Gate 5 is completed with the opening of bids for the project. If a bid is submitted, contractual provisions govern when the award of the sale takes place and when the sale will be completed and how timber removal is to occur.



**Gate 6 - Award**

Gate 6 is the formal designation of a contract between a bidder and the Forest Service.

**Figure A-1. Average Timeline for the Gate System**

Gate 1 – Completion of Position Statement  
 Gate 2 – Sale Area Design, Environmental Documentation and Decision  
 Gate 3 – Plan Implementation and Field Layout

Gate 4 – Appraisal Offering Package  
 Gate 5 – Bid Opening  
 Gate 6 – Award

<sup>1/</sup> After a sale is awarded, it is under contract from one to three years depending on size.

Source: Geneen Granger, Alaska Regional Office unpublished data, Average time for Gate 2 EIS document. (R10 2002 Planning Workshop)

## How Does the Forest Service Develop Expectations about Future Timber Markets?

The Tongass National Forest makes two determinations on volume to be offered. The first is a determination on volume to be offered for the current year (annual market demand). The annual market demand is analogous to assessing industry performance in the short-term. In the short-run a firm will make use of its existing equipment to maximize profits or minimize losses. The general approach is to consider the timber requirements of the region's sawmills at different levels of operation and under different assumptions about market conditions and technical processing capability. These assumptions provide a basis for estimating the volume of timber likely to be processed by the industry as a whole in any given year. Timber inventory requirements are acknowledged and estimated in a related calculation. The volume of timber likely to be purchased is equal to the volume needed to make up any inventory shortfall in addition to the volume likely to be harvested in the coming year. The document titled *Evaluating the Demand for Tongass Timber* (USDA, Forest Service, R-10; Morse; September 28, 1998) forms the basis for how these estimates were developed. The document titled *Tongass National Forest Timber Sale Procedures* (USDA, Forest Service, R-10; Morse, October 2000) documents actual estimates for the current year. This estimate is what the Tongass plans to offer for the current year of the Ten Year Timber Sale Schedule pending sufficient funding to do so. Final procedures can be located in the document titled: *Responding to the Market Demand for Tongass Timber* (USDA, Forest Service, R-10-MB-413, Morse, April 2000).

Based on the analysis documented in the *Tongass Timber Sale Procedures*, for Fiscal Year 2003, the Tongass National Forest offering required to meet timber supply objectives is 151 MMBF. The offer planned will be a combination of new, previously offered, or previously offered and reconfigured timber sales. Both standing timber and salvage will be components of the program. Offerings will consist of those targeted for

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Small Business qualified firms as well as a portion of the volume being made available for the open market.

### ***Life of the Forest Plan (Market Demand over the Planning Cycle)***

Given the long time involved in preparing a timber sale, the proposed timber sales in this document may not be harvested for 3 to 4 years or longer, not including appeals or litigation. The Forest Service needs some idea of what the long-term timber demand will be given cycles in the market. On average, what should the Forest Service plan for offer, given that timber from this NEPA document may not be harvested for 4 years into the future? The Forest Service needs to take a long-term view for planning purposes. To answer these questions, the Forest Service asked the Pacific Northwest Research Station for professional assistance.

As the Tongass Land Management Plan was being revised in 1997, research economists at the Pacific Northwest Research Station (PNW) were asked to update their earlier projections of Alaska timber products output and timber harvest by ownership. The most recent projections of timber harvest over the planning cycle account for several dramatic changes in the region's manufacturing capabilities, increased competition from a number of sources, and the steady erosion of North America's share of Japanese timber markets.

The Forest Service documents these projections and the means of implementation through the issuance of a Ten Year Timber Sale Schedule. Each year this plan is updated whereby the current year is dropped at the culmination of the fiscal year and a new year ten is added. The basis for this schedule is long-range timber market projections documented in the publication titled *Timber Products Output and Timber Harvest in Alaska: Projections for FY97-10* (Brooks and Haynes; PNW-GTR-409, September, 1997). These projections of Alaska timber products output, the derived demand for raw material, and timber harvest by owner are developed from a trend-based analysis. These projections reflect the consequences of recent changes in the Alaska forest sector and long-term trends in markets for Alaska products. With the closure of the two Southeast Alaska pulp mills, demand for Alaska National Forest timber now depends on markets for sawn wood and the ability to export manufacturing residues and lower grade logs. Three alternative projections are used to display a range of possible future demand (Table A-1). Areas of uncertainty include the prospect of continuing changes in markets and in conditions faced by competitors and the speed and magnitude in investment in manufacturing in Alaska.

Demand projections are important for program planning. They provide important guidance to the Forest Service for requesting budgets, for making decisions about workforce and facilities, and for indicating the need to begin new NEPA analysis for future program offerings. They also provide a basis for expectations regarding future harvest, and thus provide an important source of information for establishing the schedule of probable future sale offerings. The weight given to the projections will vary depending on a number of factors, such as how recently they were done, and how well they appear to have accounted for recent, site-specific events in the timber market.



Table A-1

**Projected National Forest Harvest<sup>1</sup>**

Fiscal Year	Projected Harvest (MMBF)			Actual
	Low	Medium	High	
1998	77.3	86.0	112.2	119.8
1999	86.4	99.3	127.9	145.8
2000	95.5	115.9	142.7	146.8
2001	104.6	129.0	157.7	47.8 <sup>2</sup>
2002	113.7	134.9	173.1	29.6 <sup>3</sup>
2003	122.8	140.8	188.9	
2004	131.9	146.5	205.0	
2005	131.9	152.2	221.4	
2006	131.9	157.8	238.2	
2007	132.0	163.4	255.3	
2008	132.0	168.9	272.8	
2009	132.1	174.3	290.7	
<b>Average</b>	112.8	132.6	182.2	98
	<b>Mean</b>		168.7	

<sup>1</sup> For Fiscal Years 2003-2009, the Tongass National Forest plans to schedule approximately 160 MMBF for sale each year over the life of the Forest Plan. This schedule is based on the projections documented in *Timber Products Output and Timber Harvest in Alaska: Projections for FY97-10* (Brooks and Haynes; PNW-GTR-409, September, 1997), and current volumes in the timber sale pipeline process. Prior to the beginning of each fiscal year the amount of volume to be scheduled in that fiscal year is once again analyzed to determine if the projection meets the anticipated need.

<sup>2</sup> Truncated logging season due to Judge James K. Singleton's TLMP Appeal Decision, March 30, 2001. <sup>3</sup> Tongass volume harvested as of August 31, 2002.

## How does the Forest Service Maintain an Orderly and Predictable Timber Sale Program?

### *Pools of Timber (Pipeline Volume)*

As discussed earlier, the Forest Service tracks accomplishment of various stages of development of each timber sale with the Gate System process. From a timber sale program standpoint, it is also necessary to track and manage multiple projects through time as projects collectively move through the Gate System. Tracking of the multiple projects can be likened to following various segments of several projects through a pipeline of time. Because of the relatively long timeframes needed to accomplish a given timber sale and the complexities inherent in timber sale project and program development, it is necessary to track various timber sale program volumes from Gate 1 through Gate 6. Gate 1 volume represents a large pool of program volume, but represents a relatively low investment from project to project. This relative investment level offers the timber program manager a higher degree of flexibility and thus, does not greatly influence the flow of volume through the pipeline. In addition, tracking of how much volume near the end of the pipeline that is in appeals or litigation may be necessary to determine potential effects on the flow of potential timber sales.

The goal of the Tongass National Forest is to provide an even flow of timber sale offerings on a sustained yield basis. In past years, this has been difficult to accomplish due to continual reductions in the suitable timberland base, reductions in the timber industry processing capabilities, rapid market fluctuations and Forest Plan modifications and litigation. To achieve an even flow of timber sale offerings, 'pools' of projects in various stages of the Gate System will be maintained so volume offered can be balanced against current year demand and market cycle projections. Today, upward trends in



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demand are reacted to by moving outyear timber projects forward leaving outyears not capable of meeting the needs of the industry. In other instances, a number of new projects are started based on today's market but not available for a number of years. By the time the added projects are ready for offer, the market and demand for this volume has changed. Three pools are being tracked to achieve an even flow of timber sale offerings:

- **Timber volume under analysis (Gate 2):** Timber volume under analysis contains sales being analyzed and undergoing public comment through the NEPA process. This process can often take from one to five years and reaches a significant milestone when a NEPA decision is made. This pool includes any project with a formal Notice of Intent through those with a decision document issued. Volume in appeals and litigation will be tracked as a subset of this pool as necessary.
- **Timber volume available for sale (Gate 3, Gate 4 and Gate 5):** Timber volume available for sale contains sales for which environmental analysis has been completed, and administrative appeals, and litigation (if any) have been resolved. They have also been fully prepared, and are available to managers to schedule for sale offerings. Managers need to maintain enough volume in this pool to be able to schedule future sale offerings in an orderly manner of the size and configuration that best meets the need of the public. As a matter of policy, and sound business practice, the Forest Service attempts to announce probable future sale offerings at least one year in advance. This allows potential purchasers an opportunity to do their own evaluations of these offerings in order to determine whether to bid, and if so, at what level.
- **Timber volume under contract (Gate 6):** Timber volume under contract contains sales that have been sold and a contract awarded to a purchaser, but has not yet been fully harvested. Timber contracts typically, but not always, give the purchaser three years to harvest and remove the timber purchased. Long standing Forest Service practice is to attempt to maintain about two to three years of unharvested timber volume under contract to timber purchasers. This volume of timber is the industry's dependable timber supply, which allows immediate flexibility in business decisions. This practice is not limited to the Alaska Region, but is particularly pertinent to Alaska because of the nature of the land base. The relative absence of roads, the island geography, the steep terrain, and the consequent isolation of much of the timber land means that timber purchasers need longer-than-average lead times to plan operations, stage equipment, set up camps, and construct roads prior to beginning harvest.

What drives the various timber sale program pipeline pool volume is a combination of actual harvest and projected demand. As purchasers harvest timber, they deplete the volume under contract. Managers track harvest, and offer sales that give the industry as a whole the opportunity to replace this volume and build or maintain their working inventory. Although there can be significant variation for practical reasons from year to year, in the long-run, over both the high points and low points of the market cycle, timber harvest will equal timber sales.

The Forest Service, based on historical patterns, determines the amount of pipeline volume in each of the pools. Table A-2 displays volume levels that are expected to be maintained in each pool.

- Pool 1, Timber Volume Under Analysis, is expected to be maintained at approximately 4.5 times the amount of anticipated harvest.
- Pool 2, Timber Volume Available for Sale, is expected to be maintained at approximately 1.3 times the amount of anticipated harvest.

Table A-2  
Pipeline Pool Matrix

Pipeline Pool Volume	Flows	End of FY 02	Planned During FY 03	End of FY 03
1. Volume Under Analysis <sup>1</sup> (Gate 2) (MMBF) (4.5 times expected harvest)		413 <sup>2</sup>	562 <sup>3</sup>	293 <sup>3</sup>
2. Volume Available for Sale <sup>4</sup> (Gate 3, Gate 4 and Gate 5) (MMBF) (1.3 times expected harvest)	NEPA Cleared	108 <sup>3</sup>	319 <sup>3</sup>	276 <sup>3</sup>
	Offered		151 <sup>5</sup>	
	Sold		123 <sup>5</sup>	
3. Volume Under Contract <sup>6</sup> (Gate 6) (MMBF) (3.0 times expected harvest)		196 <sup>7</sup>		369 <sup>8</sup>
	Volume Harvested *		123 <sup>9</sup>	

Matrix crosswalk between Gate Tracking System and Pools of Timber Concept:

<sup>1</sup>Gate 2: Decision document that is viable for sale after completion of appeals and litigation.

<sup>2</sup>Actual figure from Tongass National Forest Schedule of Proposed Actions.

<sup>3</sup>Estimated figure.

<sup>4</sup>NEPA cleared timber volume: Gate 3, field preparation work; Gate 4, timber sale contract package preparation; Gate 5, Timber Sale bid opening.

<sup>5</sup>Tongass National Forest Timber Sale Procedures, Morse, October 2000, Table page 4, updated August 2003 by William Wilson, Regional Office, Forest Management Planning Group Leader.

<sup>6</sup>Gate 6: Timber sale award and contract execution, based on the Timber Sale Statement of Accounts.

<sup>7</sup>Volume under contract as of June 30 2002. Assumes the following: GFP Sawmill (50MMBF) and Metlakatla Sawmills (95 MMBF) removed from capacity estimate. Estimate of uneconomic timber sales eligible for cancellation removed from VUC (70MMBF). Sales not available due to Judge Singleton's injunction removed from VUC (65MMBF).

<sup>8</sup>Three times the amount of volume projected in the LOW market scenario given in Timber Output and Timber Harvests in Alaska: Projection for 1997 – 2010, Gen. Tech. Report. PNW-GTR-409, Portland, Oregon, USDA Forest Service, PNW Research Station.

<sup>9</sup>Projected harvest for FY 2003, from the PNW Research Station using the LOW market scenario (see #8 above).

\*Note-The amount of volume estimated to be harvested for the year sets the basis for what will be maintained in Pools 1-3 (Gates 2 through 6). Should this estimate be incorrect, adjustments can be made in the following years without significant departures in outyear program capabilities.

- Pool 3, Volume Under Contract, is expected to be maintained at approximately 3 times the amount of anticipated harvest.

The objective of the pools concept is to maintain sufficient volume in preparation and under contract to be able to respond to yearly fluctuations in a timely manner.

### How Does the Forest Service Decide Where Timber Sale Projects Should be Located?

#### *The Allowable Sale Quantity (ASQ)*

The 1997 Forest Plan Record of Decision established an ASQ for timber at 2.67 billion board feet per decade, which equates to an annual average of 267 million board feet (MMBF). The ASQ serves as an upper limit on the amount of timber that may be offered for sale as part of the regularly scheduled timber sale program. It consists of two separate Non-Interchangeable Components (NICs) called NIC I, which is 2.2 billion board feet of timber per decade, and NIC II, which is .47 billion board feet per decade. There are two purposes of partitioning the ASQ into two components:

- 1) to maintain the economic sustainability of the timber resource by preventing the over-harvest of the best operable ground and
- 2) to identify that portion of the timber supply that is at risk of attainment because of marginal economic conditions.

The NIC I component includes lands that can be harvested with normal logging systems. The NIC II component includes land that has high logging costs due to isolation or special equipment requirements. Most of these NIC II lands are presently considered economically and technically marginal.

The Tongass National Forest has been unified under one Forest Supervisor. For planning and scheduling purposes, the allowable sale quantity is distributed by Ranger District. Each District has been allocated a portion of the timber harvest program based on the FORPLAN computer run and availability of suitable and available acres, to implement the Forest Plan, and Section 101 of the Tongass Timber Reform Act (1990). The Forest Plan set the Forest-wide allowable sale quantity (ASQ) upper limit at 267 MMBF per year. The distribution of the planned ASQ harvest among the Districts is listed in Table A-4 (all volumes are identified as sawlog plus utility).

Historically, timber harvest has been spread across the Tongass National Forest with the long-term timber sales and mills located in Sitka and Ketchikan. The suitable timber land base is spread across the Forest as displayed in Figure A-2. In answer to the question presented for this section of the Appendix, the suitable timber base is capable of producing the ASQ documented in the 1997 Forest Plan Record of Decision.

Table A-3

#### **Timber Volume in Appeals and/or Litigation**

Timber volume remanded on appeals and/or enjoined in litigation <sup>1/</sup>	33.9 Million Board Feet
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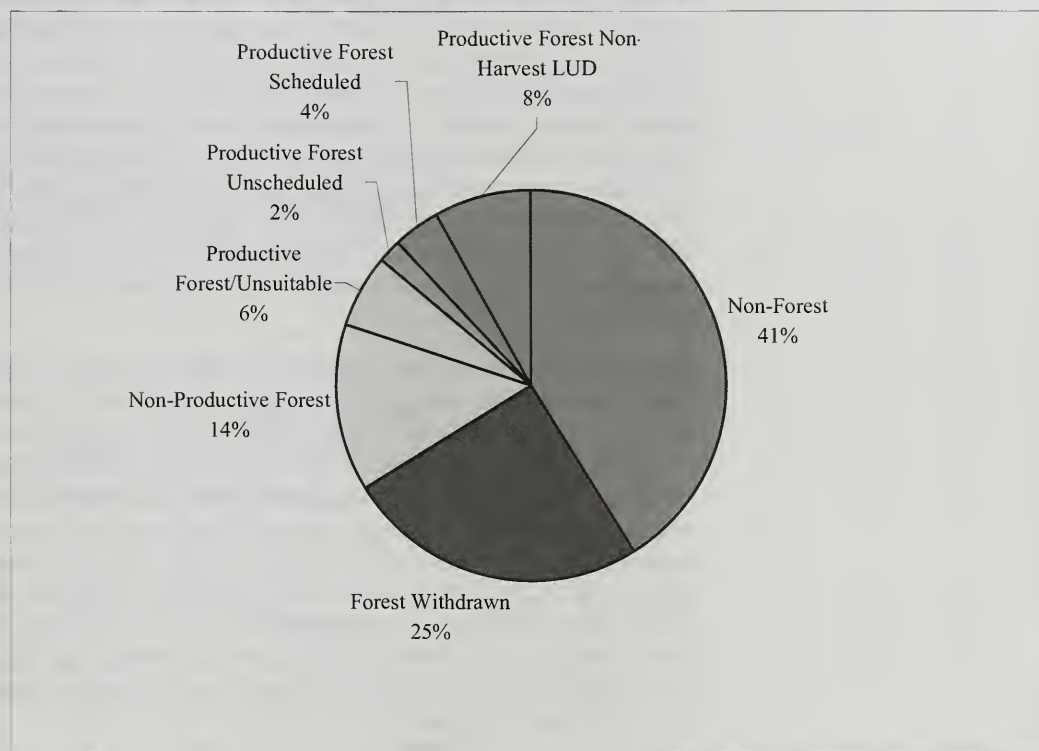
<sup>1/</sup> As of 01.01.03. This figure does not include those environmental documents on hold due to Judge Singleton's March 30, 2001 court ruling.



Table A-4  
Distribution of ASQ Among the Tongass National Forest Ranger Districts

Tongass National Forest Ranger District	Non-Interchangeable Components	
	NIC I	NIC II
Ketchikan	32	7
Thorne Bay	42	9
Craig	33	7
Wrangell	28	6
Petersburg	50	9
Sitka	17	4
Hoonah	7	2
Juneau	7	2
Yakutat	4	1
Admiralty	0	0
<b>NIC Totals</b>	<b>220</b>	<b>47</b>
<b>ASQ Total(mmbf)</b>	<b>267</b>	

Figure A-2  
1997 Forest Plan Timber Resource Suitability Analysis



Non-Forest – Land that has never supported forests, e.g. muskeg, rock, ice, etc.

Forest Withdrawn – Forest lands designated by Congress, the Sec. of Agriculture, or Chief for purposes that preclude timber harvest are classified as unsuitable, e.g. LUD Congressionally Designated Roadless Areas.

Non-productive Forest – Forest land not capable of producing crops of wood.

Productive, Non-harvest LUD – Productive forest lands that are not suited for timber production due to Forest Plan land use designation e.g. Semi-Remote Recreation, Old-growth Habitat, etc.

Productive Forest Unsuitable – Forest land unsuitable for timber due to physical attributes (steep slopes) and/or inadequate information to insure restocking trees (soils).

Productive Forest Scheduled – Forest land scheduled over the rotation available for timber harvest.

Productive Forest Unscheduled – Forest land that meets all the criteria for timber production availability but not scheduled for harvest over the rotation.

Source: Appendix A, 1997 Forest Plan

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The chart depicts the productive suitable land base that is scheduled for timber harvest activities. Four percent of the Tongass land base generates the allowable sale quantity of 267 MMBF per year. The remainder of the land, approximately ninety-six percent, is not scheduled, does not allow or will not support timber harvest activities.

### ***District-Level Planning***

The Forest Supervisor for the Tongass National Forest has discrete responsibilities for the overall management of the Forest's timber sale program. Included within these responsibilities is making the determination on the amount of timber volume to be made available to industry, as described above. Once a determination is made for the current year (annual demand) offer level, the information is presented to Congress via the Regional Forester and Chief of the Forest Service. Whether or not funding is appropriated to attain the program is the responsibility of the Congress and the President of the United States.

While the debate on funding takes place, the Tongass Forest Supervisor directs the District Rangers to formulate timber sale schedules that attain the prescribed offer level for the current year as well as develop outyear timber programs based on projected market demand for the planning cycle. District Rangers are also directed to prioritize efforts in areas that are not subject to the uncertainties of pending legislation and litigation. It is the Ranger's role to recommend to the Forest Supervisor timber sale projects that meet Forest Plan goals and objectives. Districts work on various projects simultaneously resulting in continual movement of projects through the stages of the timber program pipeline. Their schedule allows the necessary time to complete preliminary analysis, resource inventories, environmental documentation, field layout preparations and permit acquisition, appraisal of timber resource values, advertisement of sale characteristics for potential bidders, bid opening, and physical award of the timber sale. Once all of the Rangers' recommendations are made and compiled into a consolidated schedule, the Forest Supervisor is responsible for the review and approval of the final plan.

Pending Congressional appropriations, the sale schedule is implemented. In the event insufficient funds or resolution to pending litigation or legislation serve to delay the desired outputs, timber sale projects are selected and implemented on a priority basis. Generally, the higher priority projects include sales where investments such as road networks, camps or log transfer facilities have already been established or where land management status is not under dispute. Those sales that are not implemented or only partially implemented are moved to the outyear. The sale schedule becomes very dynamic in nature due to the number of influences on each of the districts. A formal review of the schedule is done annually by the Forest Supervisor in consultation with the District Rangers, and amendments are made as needed through the course of the year. (The Tongass Timber Sale Plan is located on the Tongass National Forest Website, [www.fs.fed.us/r10/tongass/](http://www.fs.fed.us/r10/tongass/)).

The National Forest Management Act requires the Forest Service to develop timber sale schedules that encompass the life of the Forest Plan. The recent Tongass National Forest Planning process culminated in issuance of the *Forest Plan Record of Decision for the Tongass Land and Resource Management Plan*. In response to this Plan, the Tongass has prepared a Ten Year Timber Sale Schedule for Fiscal Years 2002-2012. The Fiscal Year 2003 offer level is based to the extent possible on annual market demand estimates. Planning delays attributable to resolution of the Roadless Rule and court ordered injunctions have affected this offer level. The remaining years, 2004-2012, are based on market demand projections over the planning cycle. Table A-5 denotes the first year of the ten-year plan. Fiscal Year 2003 is listed below to show the reader an example of the information available and display the timber sales scheduled for the current fiscal year.



Table A-5  
Tongass Ten Year Timber Sale Plan-Fiscal Year 2003

NEPA Project	Decision		Sale Name	Vol S+U		FY03 Gate	FY03 Gate
	Date	RD		(MMBF)	Class	3	5
Licking Creek		KMRD	Licking Creek	16.8	S	12.0	12.0
Licking Creek		KMRD	Licking Creek South	4.8	S	4.8	4.8
Boundary (H.L.)		KMRD	Boundary	3.0	S	3.0	3.0
Mop Pt/91 Knot		KMRD	91-Knot Reoffer	0.5	S	0.5	0.5
Cholmondeley		CRD	Dr. Point	16.0	S	16.0	16.0
Cholmondeley		CRD	Skowl	7.0	S	7.0	7.0
Craig Small Sales		CRD	Various Small Sales	0.5	S	0.5	0.5
Cholmondeley		CRD	Sunny (FY99 Sale)	7.0	S	7.0	7.0
Cholmondeley		CRD	Cher (FY99 Sale)	5.0	S	5.0	5.0
Chasina EIS		CRD	Johnston Mtn. (FY01 Sale)	5.9	S	0.5	5.9
TNB Small Sales EA		TNB	Various Small Sales	3.0	S	3.0	3.0
Roadside EA		TNB	Small Sales	2.0	S	2.0	2.0
Roadside EA		TNB	Small Sales	2.0	S	2.0	2.0
Lab Bay EIS	Jan 97	TNB	Thorne Island	3.5	S	0.5	3.5
Luck Lake	Jun 00	TNB	Luck Lake (FY 00)		O		8.0
Control Lake EIS	May 98	TNB	Mad Rush (FY 01)		O		5.3
Heceta Second Growth		TNB	Heceta CT	8.0	S	8.0	8.0
Couverden		JRD	Homeshore	25.0	S	15.0	15.0
HRD Small Sales		HRD	Small Sales	0.4	S	0.4	0.4
Yakutat Salvage EA		YRD	Yakutat Salvage	10.0	S	10.0	10.0
Scott Peak EIS		PRD	Sherman Peak	12.0	S	8.0	8.0
Woodpecker	Proposal	PRD	Woodbine (Unit 187)	0.1	S	0.1	0.1
Woodpecker	Proposal	PRD	Woodchuck (Unit 161A)	0.2	S	0.2	0.2
Twin Creek EA		PRD	Frenchy 99		S		1.0
South Lindenberg EIS	Dec 96	PRD	Redo		S	5.0	5.0
Threemile		PRD	Threemile	20.0	S	20.0	20.0
South Lindenberg	Dec 96	PRD	Short Run		S	1.0	1.0
Doughnut EA	Apr 00	WRD	Doughnut		S		3.4
Skipping Cow	Apr 00	WRD	Skipping Cow Reoffer		S		31.0

\*Volumes displayed are for planning purposes only and do not constitute a decision. The Ten Year Schedule provides a significant amount of information and is described as follows:

The Ten Year Timber Sale Plan above includes the following information:

**NEPA Project:** Environmental document project name. This name may or may not differ from the timber sale project name depending on how many sales originate from the original NEPA document.

**Decision Date:** The date of the decision document, whether planned or actual. "X" denotes project has started and completion is within the Fiscal Year but a specific date (e.g. month) is not firm.



## Appendix A

**RD:** Ranger district office where project is located (PRD=Petersburg Ranger District).

**Sale Name:** Timber sale project name. FY 00 or FY 01 designates that this timber sale was originally planned to be sold in fiscal year 2000 or 2001, but due to late NEPA decisions, personnel going to lower 48 states' fires, and other delays caused the timber sale to be advertised late and sold early in FY 2001. The timber sale may also have been advertised and unsold and the sale is now planned to be reoffered.

**Vol S+U (MMBF):** Possible timber volume (sawlog plus utility) that could result if an action alternative is selected from the NEPA document. Generally only appears once in the year the decision is made. If no volume is shown, decision on document was made in another fiscal year.

**Class:** Timber sale size class determination (S=SBA, O=open sale to all bidders).

**FY02 Gate 3 (Layout):** Only appears in fiscal year sale is to be laid out and appraised. May appear in more than one year.

**FY02 Gate 5 (Offer):** Only appears in fiscal year sale is to be offered. Number designates potential volume.

The location of timber sale projects are based on the land allocation directed in the Forest Plan decision. Timber sales are located where permitted based on the prescription and objectives of the land use designation. Timber sale projects are located to varying degrees in land use designations identified as Timber Production, Modified Landscape, and Scenic Viewshed.

As stated earlier, the District Ranger is responsible for identifying and recommending the project areas for the Ten Year Timber Sale Schedule. The considerations the Ranger makes on each project includes but are not limited to the following:

- The project area contains a sufficient number of acres allocated to development land use designations to make timber harvest in the area appropriate under the Forest Plan. There is an adequate amount of suitable and available land for timber harvest opportunities. Available information indicates harvest of the amount of timber volume being considered for this project can occur consistent with the Forest Plan standards and guidelines and other resource protection requirements.
- The project and proposed timber harvest volume can contribute to achieving the goals and objectives of implementing the Forest Plan.
- The potential investment in infrastructure (roads, bridges, log transfer facilities, camps, rock pits, etc.) is necessary for sustainable timber harvest offerings. Where infrastructure already exists, this project will enable maintenance and upgrade of the facilities, which is necessary for removal of timber volume.
- The potential effects on subsistence and other resources.
- Based on current year and anticipated outyear timber volume demand; volume currently under contract; anticipated Congressional allocations; and the availability of resources to fully prepare and offer this project for sale, this project is consistent with and meets all laws and regulations. These laws and regulations include Forest Service Policy; Best Management Practices; the 1997 *Tongass Land and Resource Management Plan FEIS and ROD*; and all other laws and regulations governing the removal of timber from National Forest System lands.

## How Does This Project Fit into the Tongass Timber Program?

The Madan project was proposed for offer beginning in Fiscal Year 2004 (Tongass National Forest Ten Year Timber Sale Schedule, approved by Thomas Puchlerz, Forest Supervisor, September 30, 2002). A court injunction delaying this decision has recently been lifted allowing the project to move forward. This ten-year schedule is being revised to account for this injunction and for development LUDs currently restricted under the Roadless Rule. Forest-wide, total volume, which will be available for offer in Fiscal Year 2003 is approximately 84.6 MMBF. This is almost 67 MMBF short of the projected demand of 151 MMBF. The Madan Project, which is exempt from the prohibitions of the Roadless Rule, will be scheduled as soon as planning can be completed. The Madan project is currently in Gate 2, "Volume Under Analysis." The project's action alternatives being addressed in the NEPA analysis range from approximately 19 MMBF (38,000 CCF) to 32 MMBF (64,000 CCF) that could contribute to the Tongass Timber Sale Program. As described earlier, the volume of timber needed to maintain this Pool is 413 MMBF. Currently, forest-wide, Pool 1 contains from 162.6 MMBF to 187.4 MMBF inclusive of this project. Therefore, the Madan project is consistent with program planning objectives and necessary to meet the goal of providing an orderly flow of timber from the Tongass on a sustained yield basis. Given the included information, it is reasonable to be conducting the environmental analysis for this project at this time.

## Why Can't This Project Occur Somewhere Else?

As previously discussed, the market demand for timber for the next 10 years is expected to average 168.7 MMBF per year. The suitable and available land base on the Tongass is capable of supporting an Allowable Sale Quantity of 267 MMBF annually, 220 MMBF of which is considered economical (i.e. the NIC I component). Based on the projected market demand for the planning cycle, all suitable timberlands will eventually be scheduled for harvest to meet the current and projected demand for raw material in Southeast Alaska. The relocation of this project to another area is inefficient and potentially contrary to the standards and guidelines of the Forest Plan. This decision is based on the cumulative impact on other resources from past harvest activities, the location of timber sales under contract, and the eventual use of all suitable lands for timber sale projects.

- Areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).
- The potential effects on subsistence resources are projected to differ little based on the sequence these areas are harvested. Harvesting other areas with available timber on the Tongass National Forest is expected to have similar potential effects on resources, including those used for subsistence, because of widespread distribution of subsistence use and other factors. Harvest within other areas is foreseeable, in any case over the forest-planning horizon under the Forest Plan.
- Providing substantially less timber volume than required to meet Forest Plan and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the project area is not necessary or reasonable.
- It is reasonable to schedule harvest in the project area rather than in other areas at the present time based on previous harvest entry and access, level of controversy over subsistence and other effects, the ability to complete the National

## Appendix A

Environmental Policy Act (NEPA) process and make timber available to meet the needs of dependent industries. Other areas that are reasonable to consider for harvest in the near future are the subjects of other project EISs that are currently ongoing or scheduled to begin soon.



# **APPENDIX B**

## **UNIT CARDS**

WILLIAM B. ELLIS

WILLIAM B. ELLIS

# **APPENDIX B**

## **UNIT CARDS**

The Madan Project Unit Cards were published with the Draft EIS. Slightly updated final cards are available for review in the Project Planning Record. Unit cards for the Selected Alternative will be published with the Record of Decision.



ALFRED D.

NEW YORK

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# **APPENDIX C**

## **ROAD CARDS**

UNIVERSITY OF  
MICHIGAN



# **APPENDIX C**

## **ROAD CARDS**

The Madan Project Road Cards were published with the Draft EIS. Slightly updated final cards are available for review in the Project Planning Record. Road cards for the Selected Alternative will be published with the Record of Decision.

ATTENDANCE  
BOOK

NAME \_\_\_\_\_

# APPENDIX D

## LOG TRANSFER FACILITY DESIGN



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THE UNIVERSITY OF CHICAGO

## Appendix D

# Madan LTF Site Selection, Design, and Operating Guidelines

### Log Transfer Facilities

A log transfer facility (LTF) is the location where logs are transferred between a ground-based transport system of roads and trucks and a water-based transport system of rafts, barges, and tugboats. Appendix G of the Revised Forest Plan (USDA Forest Service, 1997) contains LTF siting guidelines. The guidelines were developed by the Alaska Timber Task Force Log Transfer Facility Guidelines Technical Subcommittee in 1985. The guidelines identify physical characteristics necessary for safe and efficient log transport as well as minimum requirements for mitigation of water quality and aquatic habitat effects. We consider all of the guidelines and develop LTFs which represent the best mix: allowing activities to proceed while meeting all applicable statutory and regulatory requirements. The LTFs undergo a complex and rigorous permitting process involving multiple federal and state agencies. The information contained in this appendix is intended to facilitate the permitting process and provide an opportunity for the EIS reader to comment on Madan Timber Sale LTF locations, construction, operation, and monitoring.

No roads currently exist in the Madan project area. Three action alternatives for the Madan project propose developing an LTF at Jenkins Cove and at Moose Creek. Alternatives 2 - 5 depend on development of a road transportation system that would originate at new LTFs in Jenkins Cove, Moose Creek, or both sites. A combination of several potential LTF sites and/or options have been considered for the Madan Project Area. The Moose Creek LTF was originally planned for construction on the east side of Moose Creek. However, it was later determined that the associated road system on the east side of Moose Creek was not feasible and this location was then dropped from further consideration. This required the LTF to be shifted to the west side of Moose Creek, which proved to be a more suitable location in terms of water depth and subsurface topography. Both Moose Creek and Jenkins Cove LTFs have shifted to slightly different locations from the initial stages of project planning. This shifting was minor and primarily a result of input from the US Fish and Wildlife Service (USFWS). Dive reports revealed that minor shifting would result in more suitable water depths and improved flushing. Field and SCUBA dive investigations were conducted by the USFWS and National Marine Fisheries Service in 1984, and by the USFWS in 1997 and 1998 (USFWS, 1984, 1997, 1998). The USFWS found the two current sites to be suitable for LTF development and unlikely to significantly affect marine and estuarine resources.

Many of the variables that can affect the design and operability of any given LTF are addressed through the LTF siting guidelines. Four issues that are pertinent to analysis of the type of LTF to construct include in-water development, upland development, bark deposition and economics.

**In-water Development** – Usually, a low angle rock ramp designed for watering of logs requires rock fill to be placed in the water in such a manner that a log-loader can

## Appendix D

effectively drive down the ramp to the water's edge and place bundled logs into the water. The ramp length depends on the slope of the beach, with a shallower beach requiring a longer ramp to allow for effective use at any tidal stage. A barge facility is usually sited to take advantage of deep water, or a causeway is built across a shallow beach to a point where the water will be deep enough to allow barge access. While not ideally suited for barge loading, a low-angle rock ramp can be designed to accommodate either land-to-water or land-to-barge log placement. Barge-only facilities cannot accommodate placement of logs into the water.

- Due to topographic constraints at the Moose Creek LTF site, a causeway would need to be built to allow for barge use. The amount of in-water development (size of the "footprint") would be basically the same for either a barge-only facility or a low angle rock ramp.
- The Jenkin's Cove site does have a deeper water access point that could be developed as a barge loading facility or as a floating log slide. For both the Jenkin's Cove and the Moose Creek sites, development of either a small barge facility or a log watering facility would result in basically the same amount of in-water development.

**Upland Development** – LTF's designed for direct placement of logs into the water can operate at almost all stages of the tide. Usually, logs are trucked directly from the landing or a small sort yard (2 acres) to the LTF, where they are placed directly in the water. Since tide stage does not restrict use of the LTF, an even flow of work can be maintained and log handling is kept to a minimum. Barge facilities are usually accessible during limited tidal stages, and in order to make efficient progress during a short loading window, logs need to be stockpiled near the LTF. To meet the need for stockpiling logs between barge loading, either the LTF site needs to be significantly enlarged or a larger sort/storage yard (5+ acres) needs to be developed in close proximity to the LTF.

- Both Jenkin's Cove and Moose Creek LTF sites have small sort yards identified within 400 feet of the LTF, which could be developed at a large enough size to accommodate log storage for barge loading.

**Bark Deposition** – Loose bark and debris can be knocked off logs when they are placed directly in the water. This bark and debris can accumulate at LTF sites, reducing the marine productivity. Bark deposition is much less of a concern when logs are placed on barges, because considerably less bark is knocked off into the water.

**Economics** – Design and construction costs are generally higher for barge-only facilities than for log-watering facilities. Barge facilities usually require a higher degree of technical design, more detailed construction requirements, and larger amounts of fill material. Economics of rafting versus barging varies with each operator. Designing facilities that can be easily modified to accommodate either rafting or barging allows potential operators the most flexibility to meet their transport needs.

From an environmental standpoint, log-watering facilities generally pose more potential associated resource effects to the marine environment due to the potential for woody debris deposition. Because a log-watering type facility can process logs from land to water on an on-going basis, the upland sort/storage yard is generally minimal in size. This is favorable in respect to the consequences of taking land out of production, visual impacts, and potential for sedimentation into adjacent streams. Because a log-watering type of LTF generally poses the greater potential risk to marine resources, it is the type of facility analyzed throughout the EIS.

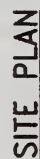
The LTF at Jenkins Cove will be a floating log slide (Figure D-1). Development of the site will also include a rock ramp for equipment and vehicle access. The log slide will be removed upon completion of the sale. The LTF at Moose Creek will be a low angle rock



ramp (Figure D-2). The rock ramps at Jenkins Cove and Moose Creek will be left in place as part of the forest transportation system.

Responses to project scoping indicated concerns about bark deposition at LTFs and impacts on marine productivity. To address these concerns, we have selected sites that meet the approval of the USFWS. Concerns were also raised about interference with commercial fishing activities. Given the constraints of coastal terrain and economics, we have limited opportunity to completely avoid potential conflicts between logging operations and commercial fishing. For example, barges, log rafts, or floating camps could be located in areas which are preferred crab or shrimp pot sites. If these conflicts occur, we anticipate they will be temporary and similar to conflicts which typically occur between competing fishermen (Figure D-3).

Additional site specific information pertaining to the guidelines developed by the Alaska Timber Task Force Log Transfer Facility Guidelines Technical Subcommittee for the proposed LTF follows.



SCALE, IN METERS

## LEGEND

MLLW = MEAN LOWER LOW WATER, ELEV. 0.0 M  
MHW = MEAN HIGH WATER  
ETL = EXTREME HIGH TIDE LINE  
CONTOURS ARE IN METERS; 1 METER = 3.28 FT.

**Figure D-1.**

JENKINS COVE LTF  
PRELIMINARY SITE PLAN

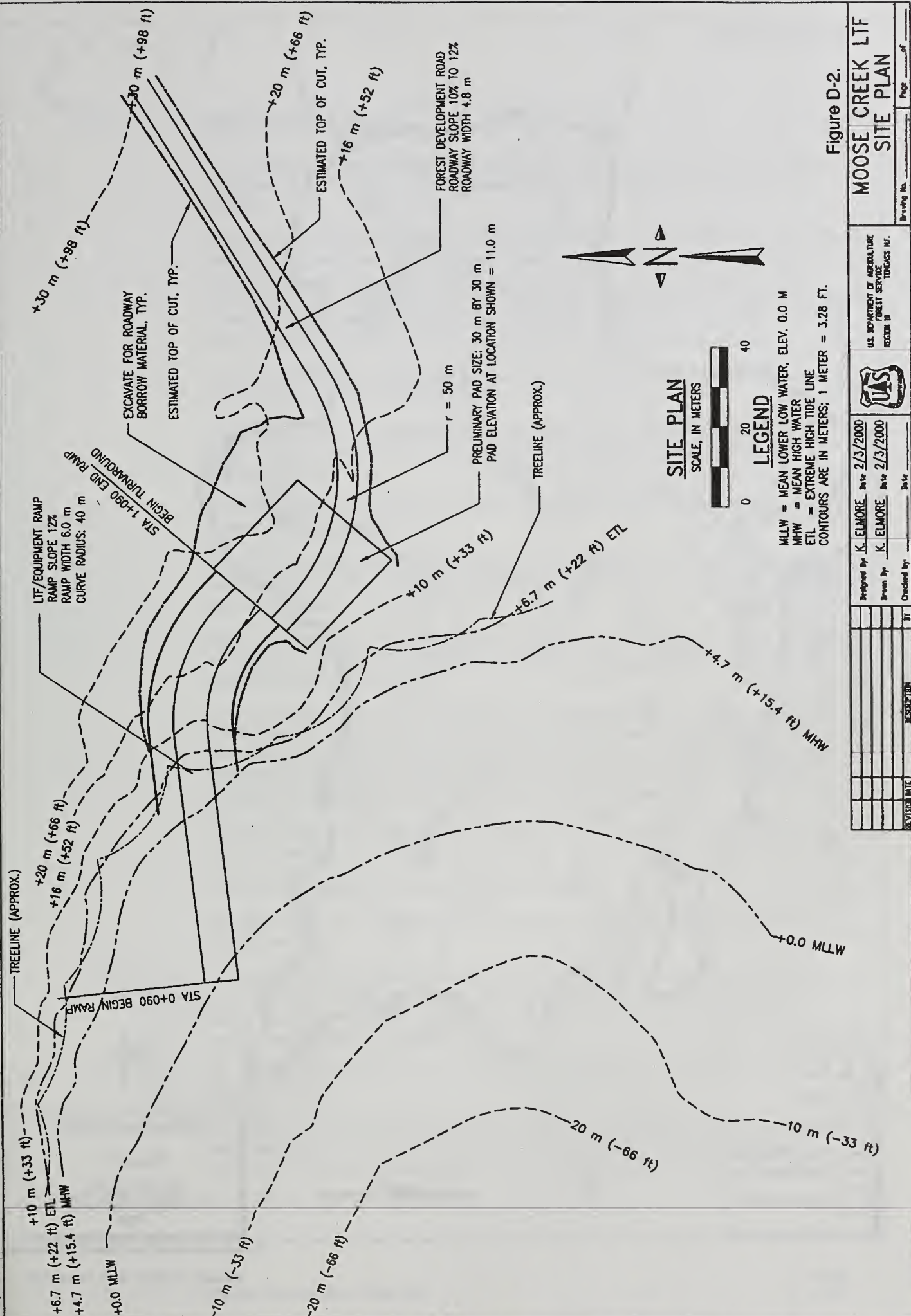
U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
REGION 10 FORECAST M.F.



Residential	K	ELMORE	2/3/2000
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ELMORE

**SECRETARY**



**Figure D-2.**

**MOOSE CREEK LTF  
SITE PLAN**

U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
REGION 10



Designed By	<u>K. ELMORE</u>	Date	<u>2/3/2000</u>
Drawn By	<u>K. ELMORE</u>	Date	<u>2/3/2000</u>
Checked by		Date	

11/24/2015





/sdame1/madan/aml/ps-6x11.aml - October 23, 2001 - barges.hpg

## Siting Guidelines

*S1. Proximity to Rearing and Spawning Areas: Avoid sites within 300 feet of the mouth of anadromous fish streams, or in areas known to be important for fish spawning or rearing.*

There are no anadromous fish streams within 300 feet of the Jenkins Cove LTF site. The nearest anadromous fish stream is Gypsy Creek, about two miles north of the proposed LTF. It is possible that some intertidal pink or chum salmon spawning occurs at the mouth of a stream draining into Jenkins Cove, approximately 900 feet from the LTF site. However, no spawners or carcasses have been observed there and no juvenile anadromous fish of any species were found in the lower reaches of the stream.

The mouth of Moose Creek (an anadromous fish stream) is over 500 feet shoreline distance from the Moose Creek LTF site.

*S2. Protected Locations: Choose sites in weather-protected waters with bottoms suitable for anchoring and with at least 20 acres for temporary log storage and log booming.*

Protection from wind and high seas is limited. All sites considered are somewhat exposed to southeasterly winds.

*S3. Upland Facility Requirements: Choose sites with proximity to at least five acres of relatively flat uplands. The LTF should provide at least 60 linear feet of operating face along the water.*

Jenkins Cove and Moose Creek LTFs are within 500 feet of proposed sort yards. These sort yards will be within the 1000 foot beach fringe. The size of the sort yards will be limited to about four acres each.

These sites will require at least 70 feet of tree clearing at the high water line for passage of log bundles. The actual operating face of the LTF structures would be narrower, only wide enough to handle equipment to be loaded and unloaded. There is adequate room at the sites for 60 feet of operating face along the water, however, visual mitigation measures incorporated into the LTF design may limit the operating faces.

*S4. Safe Access to a Facility from the Uplands: Choose sites where access roads to the LTF can maintain a grade of ten percent or less.*

The access roads can be constructed at a 10-15% grade.

*S5. Bark Dispersal: Choose sites where currents are likely to disperse sunken or floating wood debris.*

According to the Fish and Wildlife Service (1997) "flushing potential appeared good" at the Jenkins Cove site. Although no similar conclusion was reported at the selected Moose Creek site, current was noted during the dive survey. Both of the proposed sites were recommended as suitable for LTFs.

*S6. Site Productivity: Choose sites with the least productive intertidal and subtidal zones.*

According to the Fish and Wildlife Service (1997 and 1998) overall species diversity and abundance at both of the proposed sites was relatively low. These sites were not described as productive compared to some other sites examined in 1997.

## Appendix D

*S7. Sensitive Habitat: Avoid sites on or adjacent to sensitive habitats: extensive tideflats, salt marshes, kelp or eelgrass beds, seaweed harvest areas or shellfish concentration areas.*

Neither of the proposed sites are located on or adjacent to sensitive habitats.

*S8. Safe Marine Access to Facilities: Choose sites that are safely accessible to tugboats with log rafts at most tides and on most winter days.*

Tide changes may affect accessibility at the site and barges may not be able to be loaded or unloaded when the tide is below +1 foot. Winter weather (wind and high seas) may be a limiting factor at the site since the location is not well protected. Winter weather is likely to be a limiting factor for all logging operations.

*S9. Storage and Rafting: Choose sites where stored logs, log bundles, or log rafts will not ground at low tide. Minimum depths of 40 feet Mean Lower Low Water are preferred for log storage areas.*

Sites selected for log rafting provide minimum water depths as preferred.

*S10. Bald Eagle Nest Trees: Avoid sites within 330 feet of bald eagle nests.*

There are no documented bald eagle nests near Jenkins Cove. At Moose Creek, a documented nest is probably within 330 feet of the proposed LTF site. [An alternative LTF site on the east side of Moose Creek presented greater impacts to fresh water quality and fish habitat than the proposed site. Problems with the east Moose Creek LTF are documented in the planning file]. Field surveys conducted in 1997 and 1998 indicate that this nest either no longer exists or was not currently active. The area will continue to be surveyed each year to determine if the nest is active; if it is active, LTF construction and other logging activities will be subject to timing restrictions unless a variance is obtained from the Fish and Wildlife Service.

## Construction and Operation Guidelines

*C1. LTF Design: Design LTFs to be least environmentally damaging as practicable, considering economics, facility requirements, physical site constraints, site usage (timber volume) and duration, water quality and habitat mitigation, and other potential uses.*

Most environmental concerns are addressed through the siting guidelines described above for the site. Remaining concerns associated with erosion control, water quality, and visuals are addressed through design measures and operating guidelines described below.

Physical constraints due to steep topography, as well as visual objectives, present design challenges at the sites. The LTFs will require separate upland sites for log sorting, storage, and equipment maintenance. Separation of the sort yards from the LTF sites will reduce the amount of bare ground, and equipment activity adjacent to marine waters, thereby, reducing risks associated with sediment transport, oil spills, and other potential hazards to marine water quality.

We anticipate a maximum potential wood volume of about 32 MMBF from this sale. Log transfer facilities are utilized to transport logs to saltwater at both Jenkins Cove and Moose Creek under all action alternatives except one. The exception is Alternative 5, which does not enter Moose Creek drainage or develop the Moose Creek LTF. A low angle shot rock ramp is the most likely design for the Moose Creek site and a floating LTF the most likely for Jenkins Cove.

*C2. Fill Structures: Design and construct fill structures to prevent erosion, pollution, and structural displacement.*



Existing beach topography will be incorporated into the design as feasible. Fill structures will be necessary to provide bulkheads and minimize access road grades coming into the LTFs. These structures will be minimum height native log and/or stable rock revetments reinforced with riprap below storm tide level to protect fill from erosion. The bulkhead for the floating LTF will be removed upon completion of the sale.

*C3. Timing of Inwater Construction: If necessary, limit adverse impacts to marine resources and avoid conflicts with other users through construction and operation timing restrictions.*

Both LTFs were located to avoid adverse impacts to marine resources. No construction or timing restrictions are proposed to protect marine resources or to avoid conflicts with other users

*C4. Bark Accumulation Management: Use Best Management Practices to control intertidal and submarine accumulations of bark and other debris.*

LTF design will ensure low entry speed of log bundles into the water. Some bark and debris will inevitably accumulate in the water during entry and rafting operations. Log booms will contain most of the floating and near-submerged debris that may be of concern to boaters in the area. The contract administrator will ensure that the operator is aware of this concern. The contract will include provisions to ensure that the operator immediately removes logging-related debris from the water. The monitoring plan also addresses this concern.

*C5. Solid Waste Management: Remove solid wastes, including wood, generated from the LTF and dispose of it at an approved upland solid waste disposal site.*

The contract will include provisions to ensure proper disposal of solid waste in accordance with NPDES and other permits. Disposal methods may vary with type of waste accumulated. Daily cleanup of the LTF is required when accumulations of bark and other wood debris are present.

*C6. Bark Accumulation: Comply with permitting agency cleanup requirements (if any) if intertidal and submarine bark accumulations exceed standards (100% coverage exceeding one acre or an accumulation exceeding ten centimeters at any point).*

To date, cleanup has not been required at existing LTF sites known to exceed these standards. There is still some question as to whether cleanup is feasible or even beneficial. Cleanup efforts will require cooperative efforts between the Forest Service and permitting agencies. If cleanup or remediation plans are developed, they would address alternative transfer devices and methods, operational practices, and removal of bark from the ocean bottom. Remediation plans would be approved by ADEC and permitting agencies.

*C7. Bundle Speed: Control log bundle entry into receiving waters to the slowest speed practicable.*

The floating log slide LTF is designed to meet this requirement.

*C8. Surface Drainage Management: Use Best Management Practices to control surface water runoff from LTFs.*

Sort yards have been located well away from LTFs to minimize bare ground adjacent to marine waters. Grade control, sediment detention ponds, cross-drains and site cleanup requirements will address erosion and sediment transport associated with surface water runoff.

*C9. Control of Hydrocarbons: Utilize oil pollution prevention plans (BMP 12.8) and oil pollution contingency plans (BMP 12.9) to minimize petroleum products entering waters.*

## Appendix D

Petroleum product storage and equipment servicing and refueling will be controlled through specific contract provisions. Spill Prevention Control and Countermeasure plans provide organizational structure and procedures for responding to oil spills.

*C10. Onshore Log Storage: Where feasible, give preference to onshore storage and barging of logs.*

A barging facility would require more sophisticated deep water LTFs. Log transfer from the LTF to the barge would be intermittent due to tidal water depth changes. Barge facilities also require a larger than normal decking area to accommodate the intermittent nature of tidal change and LTF/barge transfer. This would have significant effects upon sale economics. While transportation costs of a barge are more economical than a raft, barging requires more log handling, which can off set the economics of transportation. For these reasons, the LTF-barge only alternative was eliminated from further analysis. While the costs associated with barge only are usually considered prohibitive, the effects resulting from placing log bundles into the water and rafting are considered acceptable at both of the proposed LTF sites. Designs for a barging facility will be considered if the footprint does not substantially exceed that of the ramp design.

*C11. Facility Maintenance and Reclamation: Maintain active and intermittent LTFs and restore abandoned LTFs.*

The floating log slide LTF at Jenkins Cove will be removed upon completion of logging operations. The low angle shot rock ramps at Moose Creek and Jenkins Cove will be maintained as part of the forest transportation system.

### Monitoring and Reporting Guidelines

*M1-6. Monitoring Requirements: Monitor for bark accumulations, oil sheen, surface runoff associated with LTF construction, operation and maintenance. Assure that corrective actions occur if necessary.*

The LTF permits will specify monitoring requirements and methods. Typically, bark accumulation is monitored annually at the beginning of each operating season according to specific protocols by SCUBA surveys at active LTFs. Waters in the vicinity of the LTF are monitored daily for the presence of visible oil sheens during LTF operation.

*M7. Report results of monitoring annually.*

A summary of LTF monitoring results is available and reports are submitted annually to EPA and ADEC. LTF permits establish reporting procedures.

# **APPENDIX E**

## **MITIGATION MEASURES BY HARVEST UNIT AND ROAD**



# REPORT OF THE COMMISSIONER OF THE LAND OFFICE

1890

The following is a list of the lands  
owned by the State of California  
in the year 1890.

County	Section	Acres
Alameda	1	100
Alameda	2	200
Alameda	3	300
Alameda	4	400
Alameda	5	500
Alameda	6	600
Alameda	7	700
Alameda	8	800
Alameda	9	900
Alameda	10	1000
Alameda	11	1100
Alameda	12	1200
Alameda	13	1300
Alameda	14	1400
Alameda	15	1500
Alameda	16	1600
Alameda	17	1700
Alameda	18	1800
Alameda	19	1900
Alameda	20	2000
Alameda	21	2100
Alameda	22	2200
Alameda	23	2300
Alameda	24	2400
Alameda	25	2500
Alameda	26	2600
Alameda	27	2700
Alameda	28	2800
Alameda	29	2900
Alameda	30	3000
Alameda	31	3100
Alameda	32	3200
Alameda	33	3300
Alameda	34	3400
Alameda	35	3500
Alameda	36	3600
Alameda	37	3700
Alameda	38	3800
Alameda	39	3900
Alameda	40	4000
Alameda	41	4100
Alameda	42	4200
Alameda	43	4300
Alameda	44	4400
Alameda	45	4500
Alameda	46	4600
Alameda	47	4700
Alameda	48	4800
Alameda	49	4900
Alameda	50	5000
Alameda	51	5100
Alameda	52	5200
Alameda	53	5300
Alameda	54	5400
Alameda	55	5500
Alameda	56	5600
Alameda	57	5700
Alameda	58	5800
Alameda	59	5900
Alameda	60	6000
Alameda	61	6100
Alameda	62	6200
Alameda	63	6300
Alameda	64	6400
Alameda	65	6500
Alameda	66	6600
Alameda	67	6700
Alameda	68	6800
Alameda	69	6900
Alameda	70	7000
Alameda	71	7100
Alameda	72	7200
Alameda	73	7300
Alameda	74	7400
Alameda	75	7500
Alameda	76	7600
Alameda	77	7700
Alameda	78	7800
Alameda	79	7900
Alameda	80	8000
Alameda	81	8100
Alameda	82	8200
Alameda	83	8300
Alameda	84	8400
Alameda	85	8500
Alameda	86	8600
Alameda	87	8700
Alameda	88	8800
Alameda	89	8900
Alameda	90	9000
Alameda	91	9100
Alameda	92	9200
Alameda	93	9300
Alameda	94	9400
Alameda	95	9500
Alameda	96	9600
Alameda	97	9700
Alameda	98	9800
Alameda	99	9900
Alameda	100	10000

# Appendix E

## Site-specific Mitigation Measures Incorporated into Unit and Road Design

The specific mitigation measures that are applied to selected units and/or roads are identified in this section. Listed below is a summary of the Forest Plan Mitigation Measures. The source(s) of each general measure are listed after the measure in terms of individual Forest Plan standards and guidelines (see Chapter 4 of the Forest Plan) or BMPs (see Appendix C of the Forest Plan and Chapter 10 of FSH 2509.22, Region Soil and Water Conservation Handbook). Summary tables (E-1 and E-2) showing the units and roads to which the specific measures apply are located at the end of this appendix.

### Karst and Cave Resources

**K1 Avoid Effects on Karst/Cave Features:** Avoid road construction or modify harvest unit design to avoid impacts on karst or cave features. (KARST - III4)

**K3 Other Specific Protection Measures for Karst/Cave Features:** Develop site-specific protective measures for karst and cave features. (KARST - III4)

### Fish, Water, and Soils

**F1 Riparian Buffers:** Establish no-harvest and selective cut buffers along streams and around lakes to protect riparian areas as defined by the Riparian Standards and Guidelines. Protect buffers from adjacent harvest activities (e.g., directional felling, split yarding, suspension requirements). (RIP2, BMP 12.6)

**F2 Directional Felling Along Buffers:** Trees identified for harvest will be felled to avoid riparian areas designated for "no commercial harvest" and stream courses. (RIP2-II)

**F3 Class III/IV Stream Protection:** Split yard and directionally fall trees away from Class IV streams without buffers. (RIP2-II)

**F4 Yarding Across Streams:** Directionally fall and fully suspend logs where yarding is to be done across streams or the full length of a stream or drainage. (RIP2-II)

**F5 Fish Passage:** Maintain fish passage at Class I and II stream road crossings using properly designed stream crossing structures (consult the Aquatic Habitat Management Handbook, FSH 2609.24). (FISH112-IV)

**F6 Use of Bridges:** Install bridges at designated stream crossings to minimize the amount of sediment entering streams and/or to ensure good fish passage (TRAN 214-II)

**F8 Siting of Road-Stream Crossings:** Modify the location of road-stream crossings to correspond with stable stream reaches. (TRAN214-II)

## Appendix E

**F9 Routing of Roads near Streams:** Modify road routes to avoid locations near fish-bearing streams. (TRAN214-II)

**F10 Routing of Roads through Wetlands and Other Sensitive Areas:** Modify location of Forest Development Roads to minimize impact to wetlands, floodplains, estuaries, and tidal meadows. (TRAN214-III)

**F11 Harvesting Timber in/near Wetlands and Floodplains:** Modify unit design or logging system to avoid or minimize damage to muskegs, other wetlands, or floodplains. (S&W112-I, BMP 12.4 and 12.5)

**F13 Stormproofing Roads:** Design system roads with oversized culverts, outfall riprap, armored dips adjacent to culverts, substantial ditch blocks, drivable waterbars, and/or other measures to prevent culvert failure or erosion during periods of inactivity. (TRAN22-I)

**F15 Avoid Harvesting High Hazard Soils:** Modify unit design to avoid very high mass movement areas, including slopes greater than 72 percent. (S&W112-I, BMP 13.5)

**F16 Soil/Water Protection along Roads on Very High Hazard Soils:** Where avoidance of road construction along unstable slopes is not possible, take special precautions with fill to prevent soil erosion, stream sedimentation, and mass wasting or require full bench construction and end hauling of excavated material. (S&W112-I, TRAN 214-II, and BMP 14.7)

**F17 Soil/Water Protection along Roads on High Hazard Soils:** Where avoidance of road construction along unstable slopes is not possible, take special precautions with fill to prevent soil erosion, stream sedimentation, and mass wasting or require full bench construction and end hauling of excavated material. (S&W112-I, TRAN 214-II, and BMP 14.7)

**F18 Suspension Requirements to Protect Soils:** Use partial- to full-suspension logging systems in areas with high mass movement potential or McGilvery soils. (S&W112-I, BMP 13.9)

### Timber

**T1 Maintain Advanced Regeneration:** Maintain advanced regeneration within the units to meet reforestation needs and stand objectives. (TIM111-2-I)

### Wildlife and Threatened/Endangered/Sensitive Species

**W1 Provide Habitat Diversity by Using the Clearcutting with Reserves System:** Provide for greater habitat diversity on a stand level over time by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112 - III)

**W5 Patch or Strip Clearcutting:** Provide for greater habitat diversity on a stand level over time by using patch or strip clearcutting (two-aged or uneven-aged systems) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112-III)

**W6 Provide Habitat Diversity by Using the Uneven-aged Harvest System:** Provide for greater habitat diversity on a stand level over time by using the selection method (uneven-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112 - III)



**W7 Leaving Nonmerchantable Trees and Snags:** Provide for greater habitat diversity on a stand level over time by leaving most nonmerchantable trees and snags after harvest. (WILD112 - III)

**W8 Restrictions on Helicopter Yarding:** Modify helicopter yarding routes and/or timing of helicopter activity to avoid important wildlife habitats (active bald eagle nest sites). (WILD112-XII)

**W9 Road Closures:** Close roads to motorized use to protect wolves and other species from over harvest. (WILD112)

**W13 Protection of Bald Eagle Nest Trees/Other Sites and Timing of Activities:** Avoid all activity, modify unit or road design, and/or limit timing of activities, near bald eagle nest trees, perch trees, and winter roost sites in accordance with the Interagency Agreement established with the USFWS. (WILD112-V)

**W31 Protection of Sensitive Plant Species:** Modify unit boundaries or road routing to avoid habitats supporting populations of sensitive plant species. (TE&S-II)

## Recreation And Tourism

**R1 Access Restrictions for Recreation:** Close or restrict access on roads to maintain remoteness of areas after harvest. (REC112-II)

## Scenery

**V1 Meet Visual Resource Objectives by Using the Clearcutting with Reserves System:** Reduce visual contrast with adjacent areas by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11 - III)

**V5 Patch/Strip Clearcutting:** Reduce visual contrast with adjacent areas by using patch or strip clearcutting (two-aged or uneven-aged systems) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11-III)

**V6 Meet Visual Resource Objectives by Using the Uneven-aged Harvest System:** Reduce visual contrast with adjacent areas by using the selection method (uneven-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11 - III)

**V7 Leaving Nonmerchantable Trees:** Reduce visual contrast with adjacent areas by leaving most nonmerchantable trees after harvest. (VIS11 - III)

**V8 Modification of Unit Boundaries:** Modify unit boundaries to ensure that the harvest unit meets the proposed VQO in partial retention and retention areas. (VIS11-II)

**V11 LTF Design:** Use low profile LTF design to minimize visibility from Visual Priority Travel Routes and Use Areas. (VIS11-II)

**V13 Landscape Architect Review:** Use landscape architect for review of final layout to ensure that VQO will be met.

## Appendix E

Table E-1.

Site-specific Mitigation Measures Applied to Individual Harvest Units by Alternative

Units <sup>2/</sup>	Alternative				Site-specific Mitigation Measures for Harvest Units <sup>1/</sup>																							
					Karst & Cave			Fish, Water, & Soils						Timber	Wildlife & TES Species							Scenery						
	2	3	4	5	K1	K2	K3	F1	F2	F3	F4	F11	F15	F18	T1	W1	W5	W6	W7	W8	W13	W31	V1	V5	V6	V7	V8	V13
J-1	1	1		1				1	1	1	1	1			1	1			1				1			1	1	1
J-3			1					1	1	1	1	1			1			1			1					1		
J-4		1	1					1	1	1	1	1			1			1			1					1		
J-5	1	1		1				1	1						1	1			1				1	1			1	1
J-5			1					1	1						1			1					1			1		
J-10	1	1		1						1	1				1	1			1					1			1	
J-10			1							1	1				1			1								1		
J-13	1	1		1				1	1				1		1	1			1					1			1	1
J-13			1					1	1				1		1			1	1							1		1
J-30	1			1						1	1	1			1	1			1					1			1	
J-30		1	1							1	1	1			1			1								1		
J-31	1			1				1	1			1	1		1			1	1							1	1	
J-31		1	1					1	1			1	1		1			1								1		
J-32	1			1				1	1	1	1	1	1	1	1			1	1							1	1	
J-32		1	1					1	1	1	1	1	1	1	1			1								1		
J-33	1							1	1	1	1	1		1	1			1								1		
J-36	1							1	1	1	1	1		1	1			1								1		
J-37		1	1					1	1	1	1			1	1			1								1		
J-42	1			1				1	1	1	1		1	1	1			1	1	1						1	1	
J-42		1	1					1	1	1	1		1	1	1			1		1	1					1		
J-49	1	1		1						1	1	1			1	1			1		1			1			1	1
J-50	1			1						1	1			1	1			1	1							1	1	
J-50		1	1							1	1			1	1			1								1		
J-52		1	1							1	1	1			1			1								1		
J-53	1	1		1				1	1						1	1			1					1			1	1
J-201		1	1					1	1	1	1	1		1	1			1		1	1					1		
J-202		1	1					1	1	1	1	1		1	1			1								1		
J-203		1	1					1	1	1	1	1			1			1								1		
J-204		1	1					1	1	1	1	1			1			1								1		
V-56	1		1					1	1						1	1			1					1			1	
V-57	1		1					1	1				1		1	1			1					1			1	
V-61	1		1					1	1			1			1	1			1				1	1			1	
V-64	1		1					1	1						1	1			1					1			1	
V-71	1		1							1	1		1	1	1	1			1					1			1	
V-78	1		1										1	1	1			1								1		1
V-83	1		1							1	1		1	1	1	1			1					1			1	
V-93	1		1				1			1	1		1		1	1			1					1			1	
V-97	1		1							1	1				1	1			1					1			1	1
V-111	1		1		1			1	1	1	1		1	1	1			1								1		1
V-112	1		1		1			1	1	1	1	1		1	1			1								1		
M-117	1	1	1							1	1		1		1	1			1					1			1	
M-119	1	1	1					1	1	1	1		1	1	1	1			1					1			1	
M-123	1	1	1					1	1	1	1			1	1	1								1				
M-127	1	1	1					1	1	1	1		1	1	1			1			1				1			
M-128	1	1	1					1	1			1	1	1	1			1			1					1		
M-135	1	1	1					1	1	1	1		1		1			1	1	1						1	1	
M-140	1		1				1	1					1		1	1			1					1			1	
M-148	1		1									1	1		1	1			1					1			1	
M-150	1		1										1	1	1			1	1							1	1	
M-156	1	1	1					1	1	1	1		1	1	1			1		1						1	1	
M-161	1	1	1					1	1	1	1	1	1	1	1			1								1		

1/ These mitigation measures include changes and mitigation measures that were implemented throughout the unit design process.

2/ Units that have more than one prescription (i.e., different prescriptions for the various alternatives) are listed twice so that the mitigation measures can be distinguished based on the different alternatives.

Table E-2.  
Site-specific Mitigation Measures Applied to Individual Roads by Alternative  
Site-Specific Mitigation Measures for Roads<sup>1/</sup>

Site-Specific Mitigation Measures for Roads <sup>1/</sup>																		
Roads	Alternative				Karst		Fish, Water, & Soils							Wildlife		Rec.	SCENERY	
	2	3	4	5	K1	K3	F5	F6	F8	F9	F10	F13	F16	F17	W9	W13	R1 <sup>2/</sup>	V11
10	1	1	1 <sup>3/</sup>	1			1	1	1	1	1	1			1	1	1	1
1000-300	1			1							1	1			1		1	
1000-500	1			1							1	1			1		1	
1010	1	1		1			1	1	1		1	1			1		1	
1010-200	1	1		1								1			1		1	
1010-210	1	1		1						1	1	1			1		1	
1020	1			1						1	1	1			1		1	
1050	1			1	1	1					1	1			1		1	
1050-200	1			1							1				1		1	
20	1	1	1						1	1		1	1	1	1	1	1	1
2010	1		1		1	1						1			1		1	
1/ These mitigation measures include changes and mitigation measures that were implemented throughout the unit design process. Note that several measures have been applied (e.g., F5 and F8 were applied at 2-3 locations along the 10 Road).																		
2/ These mitigation measures may or may not be applicable depending on which Road Management Option is chosen.																		
3/ Only approximately 0.2 mile of the 10 Road would be built under this alternative.																		

1/ These mitigation measures include changes and mitigation measures that were implemented throughout the unit design process. Note that several measures have been applied (e.g., F5 and F8 were applied at 2 -3 locations along the 10 Road).

2/ These mitigation measures may or may not be applicable depending on which Road Management Option is chosen.

3/ Only approximately 0.2 mile of the 10 Road would be built under this alternative.





# **APPENDIX F**

## **ROAD MANAGEMENT OPTIONS AND OPERATIONS AND MAINTENANCE COST**

APPENDIX 5

WORLD BANK DOCUMENTS AND  
PUBLICATIONS AVAILABLE ONLINE



## Appendix F

# Road Management Options and Operation and Maintenance Costs Madan Project Area

### Traffic Management Strategies

The following five strategies would be utilized to manage traffic on system roads:

1. **Encourage.** We would include destination signing at the entrance to the road in conjunction with the route marker. The road is shown on Forest visitor maps. Roads having this strategy would be maintained at Level 2.
2. **Accept.** We would provide only a route marker at the road entrance. If map clarity can be maintained we would show the route on Forest visitor maps. Roads having this strategy would be maintained at Level 2.
3. **Discourage.** Normally this would be accomplished by warning or information signs. Roads having this strategy would be maintained at Level 2.
4. **Eliminate.** The road would be physically blocked to traffic by culvert removal, gates, or berms. Roads having this strategy would be maintained at Level 1.
5. **Prohibit.** In addition to physically blocking the road to traffic, the closure would be legally enforced. Roads having this strategy would be maintained at Level 1.

### Road Maintenance Strategies

**Maintenance Level 2:** This level is assigned to roads open for limited passage of traffic. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation or other specialized uses. Log haul may occur at this level. Roads in this maintenance level are normally characterized as single lane facilities intended for use by high-clearance highway vehicles. Passenger car traffic is not a consideration.

**Maintenance Level 1:** This level is assigned to intermittent service roads during the period that management direction requires roads to be closed or otherwise blocked to traffic. Basic custodial maintenance is performed to protect the road investment and to protect adjacent resources. Drainage structures and runoff patterns are maintained. These roads may be suitable for non-highway vehicles, but their use would be discouraged. Over time it is anticipated that brush and trees will vegetate the roads, making them unsuitable for non-highway vehicles. These roads may be suitable and open for non-motorized uses.

## Appendix F

Appendix Table F-1.

**Traffic Management and Maintenance Strategies for Alternative 2 under Option A.**

Rd Segment	Maintenance Strategy	Traffic Management Strategies				
		Encourage	Accept	Discourage	Eliminate	Prohibit
10	5.00 miles					
MP 0.00-5.00	Stormproof and mtce. level 2	BB, H	HCV, NHV		PV	
1050	1.75 miles					
MP 0.00-1.75	Stormproof and mtce. level 2	BB, H	HCV, NHV		PV	
1050-200	0.14 miles					
MP 0.00-0.14	Storage and mtce. level 1		H	BB, NHV	HCV, PV	
1000-300	0.84 miles					
MP 0.00-0.84	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1000-500	0.45 miles					
MP 0.00-0.45	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1010	2.14 miles					
MP 0.00-2.14	Stormproof and mtce. level 2	BB, H	HCV, NHV		PV	
1010-200	0.66 miles					
MP 0.00-0.66	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1010-210	0.43 miles					
MP 0.00-0.43	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1020	1.75 miles					
MP 0.00-1.75	Stormproof and mtce. level 2	BB, H	HCV, NHV		PV	
1020	0.28 miles					
MP 1.75-2.03	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
20	2.84 miles					
MP 0.00-2.84	Stormproof and mtce. level 2	BB, H	HCV, NHV		PV	
2010	1.50 miles					
MP 0.00-1.50	Stormproof and mtce. level 2	BB, H	HCV, NHV		PV	
	1.52 miles					
MP 1.50-3.02	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
Total stormproof and maintenance Level 2, Option A:			14.9 miles			
Total storage and maintenance Level 1, Option A:			4.3 miles			

**Road Storage:** This is the process of putting a road into a closed condition which protects resources including soils, water quality, fisheries, and wildlife. These roads may be left in this condition for many years. The road remains on the forest road transportation inventory and will be reopened at a future date. Work involved in road storage includes: 1) establishing drainages across the roadway that are self-maintaining and that effectively prevent erosion; 2) removing culverts and bridges and establishing natural drainage patterns of streams where there is a high risk of structure failure and other protection measures would be inadequate, and bypassing ditch relief culverts with waterbars; and 3) returning the roadway to resource productivity through natural or planted vegetation (grass, browse, or trees). Stored roads will be maintained at Maintenance Level 1.

**Stormproofing:** This process leaves drainage structures in place, but provides waterbars, rolling dips, outslopes, and other features to ensure controlled runoff until any needed maintenance can be performed on the primary drainage system.

### **Road Management under Alternative 2 (Proposed Action), Road Management Option A**

Leave most of the road system open, with selective road closure for short segments of the system. Roads left open following the sale would be stormproofed by providing drivable waterbars/rolling dips when necessary. Roads scheduled for closure would be placed in storage with high risk drainage structures removed and natural drainage patterns reestablished. Roads would be routinely inspected and maintenance would be performed at the level indicated. The types of vehicles considered for the traffic management strategy include passenger vehicles (PV), high-clearance vehicles (HCV), non-highway vehicles (NHV), bicycles (BB), and hikers (H). This option is displayed on the road cards in Appendix C.

### **Road Management under Alternative 2 (Proposed Action), Road Management Option B**

All system roads would be closed after timber harvest, either by berm closure or by placing in storage. Roads closed by berms following the sale would be stormproofed by providing driveable waterbars/rolling dips. Roads scheduled for storage would have high risk drainage structures removed and natural drainage patterns reestablished. Roads would be routinely inspected and maintenance would be performed at Level 1. The types of vehicles considered for the traffic management strategy include passenger vehicles (PV), high-clearance vehicles (HCV), non-highway vehicles (NHV), bicycles (BB), and hikers (H).



## Appendix F

Appendix Table F-2.

**Traffic Management and Maintenance Strategies for Alternative 2 under Option B**

Traffic Management Strategies						
Rd Segment	Maintenance Strategy	Encourage	Accept	Discourage	Eliminate	Prohibit
10	5.00 miles					
MP 0.00-6.75	Stormproof, gate & mtce. level 1	H, BB		NHV	HCV, PV	
1050	1.75 miles					
MP 0.00-6.75	Stormproof, gate & mtce. level 1	H, BB		NHV	HCV, PV	
1050-200	0.14 miles					
MP 0.00-0.14	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1000-300	0.84 miles					
MP 0.00-0.84	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1000-500	0.45 miles					
MP 0.00-0.45	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1010	2.14 miles					
MP 0.00-2.14	Stormproof, gate & mtce. level 1	BB, H		NHV	HCV, PV	
1010-200	0.66 miles					
MP 0.00-0.66	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1010-210	0.43 miles					
MP 0.00-0.43	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
1020	1.75 miles					
MP 0.00-1.75	Stormproof, gate & mtce. level 1	BB, H		NHV	HCV, PV	

Appendix Table F-2. (Continued)

**Traffic Management and Maintenance Strategies for Alternative 2 under Option B**

Rd Segment	Maintenance Strategy	Encourage	Accept	Discourage	Eliminate	Prohibit
1020	0.28 miles					
MP 1.75-2.03	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
20	2.84 miles					
MP 0.00-2.84	Stormproof, gate & mtce. level 1	BB, H		NHV	HCV, PV	
2010	1.5 miles					
MP 0.00-1.50	Stormproof, gate & mtce. level 1	BB, H		NHV	HCV, PV	
	1.52 miles					
MP 1.50-3.02	Storage and mtce. level 1		H	BB, NHV	PV, HCV	
Total stormproof, berm closure, and maintenance Level 1, Option B:			14.9 miles			
Total storage and maintenance Level 1, Option B:			4.3 miles			

## Operation and Maintenance Costs

### *Maintenance Level 2 Road Systems*

**High-use road systems:** These roads are typically represented by those tributary to a community such as the system of roads on Wrangell Island. Annual daily traffic (ADT) amounts to approximately 20 - 30 vehicles or higher, depending on the season.

**Moderate-use road systems:** These roads are typically represented by island systems which have saltwater access, but do not have a community directly tributary to them. These roads have periods of time with concentrated high use, but usually have an ADT of less than 10. Zarembo Island is representative of this type of road system.

**Low-use road systems:** These roads are typically represented by island or mainland systems which may or may not have salt water access. There are few attractors and subsequently they have an ADT of less than 5. The Frosty Bay road system on the mainland is representative of this type of road system.

### *Maintenance Level 2 Costs*

Road maintenance costs are a primarily a function of wear and tear caused by vehicle traffic. The cost for fully maintaining a Level 2 high-use road is \$1,008 per mile per year. This cost includes road blading, bridge and culvert maintenance, brush removal, ditch cleaning, and slough/slump removal.

## Appendix F

Maintenance Level 2 moderate use roads have 40% less traffic than high-use roads and accordingly the frequency of maintenance required is less. Certain work activities such as brushing and hand road maintenance require the same effort as high use roads and therefore use a cost for Level 2 moderate use roads of \$605 per mile per year.

Maintenance Level 2 low-use roads have 65% less traffic than high-use roads and accordingly the frequency of maintenance required is substantially less. Surface rock replacement is not a consideration and the frequency of heavy equipment use is low. Proposed roads in the Madan Project Area are included in this category of low-use roads. Cost for long-use Maintenance Level 2 roads is \$353 per mile per year.

### ***Maintenance Level 1 Road Systems***

Maintenance Level 1 roads would be closed and access for motorized highway vehicles would be blocked by berms or gates. The cost of maintaining roads at this level is estimated at \$211 per mile per year.

### **Other Road Maintenance Cost Centers**

Stormproofing:	\$ 5,000/mile
Gate Installation	\$ 3,000/each
Road Storage	\$15,000/mile
Reopen Roads	\$30,000/mile
Recondition Roads	\$ 3,000/mile

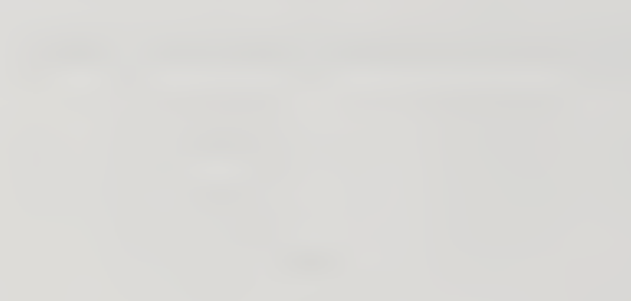


# **APPENDIX G**

## **PROJECT-SPECIFIC MONITORING PLAN**

# ANATOMY & PHYSIOLOGY

## OF THE HUMAN BODY



# Appendix G

## Project-Specific Monitoring Plan

The following are specific monitoring projects proposed for the Madan timber sale.

### Best Management Practices Implementation

Objective: Evaluate application of Best Management Practices (BMPs) for water quality and fish habitat protection. Stratify selection according to concerns listed below in order to prioritize units with water quality or fisheries concerns.

Method: Follow Tongass National Forest BMP implementation monitoring protocols. Randomly select completed roads and units. Stratify selection according to concerns listed below in order to prioritize units with water quality or fisheries concerns.

Action: The entire project area (all harvest units and roads) will be inspected by sale administrators and road inspectors to ensure compliance with all mitigation measures. Each year, a sample of recently completed Wrangell Ranger District harvest units and roads are randomly selected for monitoring by an interdisciplinary team including watershed or fisheries specialists.

The following road segments will be given high priority for monitoring due to the concerns cited:

<u>Road Number and Mile Post</u>	<u>Concern</u>
Road 6810 (#10 in EIS):	
MP 0.32	fish stream crossing
MP 0.53	switchback near fish stream
MP 0.94	slope stability
MP 1.49	slope stability
MP 1.84 to end	slope stability, unmapped stream crossings
Road 6811 (#20 in EIS)	
MP 0 to 0.71	LTF, access road, and sort yard erosion control
MP 0.71 to 1.85	slope stability
MP 1.90 to 2.84	high density of small stream crossings
Road 54100 (#1010 in EIS):	
MP 0 to 0.27	slope stability
MP 0.82	fish stream crossing
MP 1.45 to 1.74	slope stability
Road 54100 (#1010-200 in EIS):	
MP 0.19 to 0.27	slope stability
Road 54101 (#1020 in EIS):	
MP 1.74	unmapped stream crossing



## Appendix G

The following harvest units will be given high priority for monitoring due to the concerns cited:

<u>Harvest Unit Number</u>	<u>Concern</u>
J-1	Class III/IV stream protection, buffer windfirmness
J-4	proximity to fish habitat
J-5	proximity to fish habitat
J-13	proximity to fish habitat
J-31	un-mapped streams
J-32	buffer windfirmness
J-42	buffer windfirmness
J-53	proximity to fish habitat, buffer windfirmness
J-201	proximity to fish habitat, buffer windfirmness
J-202	proximity to fish habitat
J-203	proximity to fish habitat, buffer windfirmness
V-78	slope stability along yarding corridors
M-117	proximity to fish habitat
M-119	proximity to fish habitat, buffer windfirmness, yarding across Moose Creek
M-123	proximity to fish habitat, buffer windfirmness, yarding across Moose Creek, Class III/IV stream protection
M-127	buffer windfirmness
M-128	buffer windfirmness
M-135	proximity to fish habitat
M-156	buffer windfirmness

Cost: Approximately \$1500 per year

### Cultural Site Preservation

Objective: To determine if there is adequate protection of a cultural site near the mouth of Moose Creek (Site 49-PET-462). Monitoring effort is not needed under Alternative 5.

Method: Conduct field inspections and/or aerial photography at the lowest low tides before, at regular intervals during, and after timber operations.

Action: If it is determined that timber operations are causing damage to the site, operations will be halted until alternate protection measures or mitigation can be implemented.

Cost: Approximately \$1,500

### Deer Winter Habitat

Objective: To compare deer utilization of various silvicultural treatment (greater than 50% retention) areas to unharvested areas and areas harvested using conventional clear-cut methods.

Method: Conduct deer pellet group counts annually for five years, then every five years.

Action: The results will be used to develop future planning.

Cost: Approximately \$15,000

### Scenic Resources

Objective: To determine if harvest prescriptions were effective in meeting the visual quality objective.

Method: Evaluate implementation and effectiveness immediately after and two years following harvest.

Action: Adjust prescriptions as needed in future planning efforts.

Cost: Approximately \$2,000

### LTF Monitoring

Objective: Comply with permit monitoring requirements.

Method: Depending on permit requirements, monitoring may include dive surveys for bark deposition. Waters in the vicinity of LTFs are inspected regularly for visible oil sheen.

Action: Will depend on permit requirements. Visible oil sheen will require immediate attention to identify source and implement contingency plans.

Cost: \$1,000

### Management Indicator Species (Resident Fish) for Forest Plan Monitoring

Objective: Evaluate resident fish population and habitat trends.

Method: Fish populations and habitat surveys were conducted in 1999 according to forest-wide protocols at two sites in Gypsy Creek. Fish population sampling was repeated in 2000 and an additional site was selected on Jenkins Creek. If the sites are selected as representative of the Tongass National Forest, data collection will continue up until and after logging activity is completed.

Action: No action is anticipated for the Madan project. Results will be used to determine overall trends and may be applied to adapting future projects.

Cost: Each site costs approximately \$2000 per year to monitor.





# **APPENDIX H**

## **RESPONSE TO PUBLIC COMMENTS ON THE MADAN DRAFT EIS**

APPENDIX

APPENDIX TO THE  
ON THE

# **Appendix H**

## **Response to Public Comments on the Madan Draft EIS**

### **Introduction**

Appendix H includes all written comments received on the Madan Draft Environmental Impact Statement (DEIS) and the Forest Service's response to the issues addressed in the public comments. The Forest Service received 13 written comment letters (see below). The interdisciplinary team thoroughly and objectively reviewed and analyzed every substantive issue and concern. Individual comments/issues within each letter were numbered to facilitate analysis and response.

The Forest Service responses identify how the issue has been addressed in the EIS, provide an overview of Forest Service policy or direction regarding the issue, and/or direct the reader to the appropriate section of the Forest Plan for a more complete discussion.



# Letters Received from Individuals, Organizations, and Agencies

The following list includes all individuals, organizations, and agencies that the Forest Service received comments from during the 45-day comment period for the Madan Draft EIS:

Letter	First Name	Last Name	City	State	Organization	Page
1	Ralph W.	Thompson	Juneau	AK	Dept. of the Army, Corps of Engineers	H-3
2	Janice	Stuart	Anchorage	AK	Dept. of the Army, Corps of Engineers	H-9
3	Pamela	Bergmann	Anchorage	AK	Dept. of the Interior	H-13
4	Aurah	Landau	Juneau	AK	Southeast Alaska Conservation Council	H-31
5	Jennifer R.	Garland	Juneau	AK	Alaska Division of Governmental Coordination (OPPM)	H-49
6	Peter	Branson	Wrangell	AK	Wrangell Resource Council	H-61
7	Page	Else	Sitka	AK	Sitka Conservation Society	H-69
8	George	Woodbury	Wrangell	AK	N/A	H-73
9	David	Crown	Des Plains	IL	N/A	H-77
10	Lori	Morgan	Redding	CA	N/A	H-81
11	Mr. & Mrs. J. D.	Denison	Long Beach	CA	N/A	H-85
12	Bryan	Bird	Santa Fe	NM	Forest Conservation Council	H-89
13	Richard B.	Parkin	Seattle	WA	Environmental Protection Agency	H-95



REPLY TO  
ATTENTION OF:

DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, ALASKA  
JUNEAU REGULATORY FIELD OFFICE  
JORDAN CREEK CENTER  
8800 GLACIER HWY, SUITE 106B  
JUNEAU, ALASKA 99801-8079

July 6, 2000

Regulatory Branch  
East Section  
9-981095

Mr. Dick Cosby  
U.S. Forest Service  
Wrangell Ranger District  
Post Office Box 51  
Wrangell, Alaska 99929-0051

Dear Mr. Cosby:

These comments are submitted in response to the May 2000, Draft Environmental Impact Statement (DEIS) for the Madan Timber Sale, off Eastern Passage approximately 8 miles southeast of Wrangell, Alaska. This project has been assigned number 9-981095, which should be referred to in all future correspondence with this office. This letter supplements our November 10, 1998, correspondence, which provided our initial comments to this proposal during the project scoping phase.

COE-RT-1

Your proposed project was reviewed pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Section 10 of the Rivers and Harbors Act of 1899 requires that a Department of the Army (DA) permit be obtained for certain structures or work in or affecting navigable waters of the United States (U.S.), prior to conducting the work (33 U.S.C. 403). Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands, prior to conducting the work (33 U.S.C. 1344).

COE-RT-2

For regulatory purposes, the Corps of Engineers (Corps) defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Navigable waters of the U.S. are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified as navigable by the Alaska District. Eastern Passage is a navigable water of the U.S.

COE-RT-3

COE-RT-4

Normal silvicultural activities for the production of forest products that are part of an established ongoing operation are not subject to regulation under Section 404 of the Clean Water Act. To fall under this exemption the activities must not convert an area of the waters of the U.S. to a use to which it was not previously subject, whereby the flow or circulation of waters of the U.S. may be impaired or the reach reduced. The construction or maintenance of forest roads used for the sole purpose of timber harvest activities is exempt from regulation under Section 404 of the Clean Water Act, provided the roads are constructed

and maintained in accordance with Best Management Practices (BMPs) listed at 33 CFR 323.4(a)(6). These BMPs are necessary to assure that flow and circulation patterns and chemical and biological characteristics of waters of the U.S. are not impaired, that the reach of the waters of the U.S. is not reduced, and that any adverse effect on the aquatic environment is otherwise minimized. A copy of the BMPs is enclosed for your information.

COE-RT-4  
(Cont)

Action alternatives described in the DEIS indicate that from 0.1-6.5 miles of forest roads would be constructed in wetlands, which would impact from 0.6 to 39.4 acres of wetlands and require from 3 to 11 Class II and Class III stream crossings. Two Log Transfer Facilities may also be constructed at Jenkins Cove and Moose Creek associated with this timber sale.

COE-RT-5

Specific comments regarding the DEIS:

- May 19, 2000 letter: There are several project components associated with this timber sale that would occur in areas subject to Corps jurisdiction and require a DA permit under the above laws. The District Engineer is solely responsible for making the final decision on activities requiring DA authorization, however we would use your environmental documentation to the maximum extent legally possible to prevent unnecessary duplication provided it meets our regulatory requirements.
- On page 2-3, the DEIS states that the timber purchaser may use a floating camp and that if an alternative with roads is selected there may be some minor land-based facilities. On page 2-4, it states that two sort yard locations have been identified. Page C-2 indicates that the Jenkins Cove sort yard has been sited in wetlands. A single DA permit application must be submitted for all project components requiring DA authorization. Your permit application should specify the quantities and types of fill material that would be placed below the high tide line or in wetlands and the amount and type of material that would be excavated below mean high water. Plans should be provided that show all regulated activities in waters of the U.S., including wetlands, such as floating walkways, logging camps, outfalls, intakes, captive barges, log rafting areas, sort yards, etc. We are enclosing a copy of our Regulatory Program Applicant Information pamphlet, which includes a permit application. This pamphlet is designed to assist you in applying for a DA permit and provides general information and guidance on how to complete the permit application. In addition, authorization from the Environmental Protection Agency would also be required for the transfer of logs into marine waters under National Pollutant Discharge Elimination System Section 402 permit requirements.
- On Page 1-15, Section 10 of the Rivers and Harbors act of 1899 (33 U.S.C. 403) is not listed in the Legislation and Executive Orders related to the DEIS.
- On page 3-47 you indicate that wetland systems and acreage values are provided in the *Wetlands and TES Plants* Resource Report (Kerskhe and Arnett, 1999). You also indicate on page 3-110 that wetlands in the project area were identified using the 1987 Corps wetland delineation manual. We would appreciate receiving a copy of these reports for our file at your earliest convenience.

COE-RT-6

COE-RT-7

COE-RT-8



COE-RT-8  
(Cont)

- On page 3-108 you indicate that a U.S. Fish and Wildlife Service dive survey was used to identify LTF sites in Jenkins Cove and Moose Creek, however the report is not listed in Chapter 4 (References). We would appreciate receiving a copy of this report for our file at your earliest convenience.

COE-RT-9

The DEIS addresses wetland avoidance and minimization measures on page 3-133 with regard to compliance with Executive Order 11990, stating that wetland impacts would be minimized by avoiding overburden disposal in wetlands and avoiding road construction through wetlands whenever practicable. The road location cards reflect several additional opportunities to avoid or minimize impacts to wetlands. Although we recognize that there may be engineering or economic constraints that must be considered, the FEIS should provide additional rationale for the road construction at these locations (33 CFR 323.4(a)(6)):

COE-RT-10

(a) We concur with your statement on page C-14 that the intersection of Road 1000-500 and the 10 Road should be moved north if practicable. It appears that an alternate alignment would avoid approximately 0.1 miles of wetland road impacts and would also eliminate a Class IV stream crossing, based on your mapping.

COE-RT-11

(b) Road 1010 (page C-16) impacts a wetland approximately 0.6 miles southeast of the major stream crossing shown on the Road Card. It appears that the road could be shifted a few hundred feet southwest to avoid approximately 0.11 miles of wetland road impacts at this location, based on your mapping.

COE-RT-12

(c) Road 1020 (page C-28) impacts a wetland area approximately 1.3 miles southeast of the intersection with Road 10. It appears that approximately 0.38 miles wetland road impacts could be avoided if the road were to be shifted upslope, based on your mapping.

We appreciate the opportunity to provide additional comments on the Madan proposal, and are available for further discussion or clarification of our comments or regulatory requirements as necessary. If we can provide further information, please contact me at the letterhead address, by telephone at (907) 790-4490, or by FAX at (907) 790-4499.

Sincerely,



Ralph W. Thompson  
Field Office Manager

Enclosures

Section 404 of the Clean Water Act Exemptions  
Best Management Practices for Forest Road Construction  
33 CFR 323.4(a)(6)

- i. Permanent roads, temporary access roads, and skid trails in waters of the U.S. shall be held to the minimum feasible number, width, and total length consistent with the purpose of specific farming, silvicultural, or mining operations, and local topographic and climatic conditions;
- ii. All roads, temporary or permanent, shall be located sufficiently far from streams or other water bodies (except for portions of such road which must cross water bodies) to minimize discharges of dredged or fill material into waters of the U.S.;
- iii. Road fill shall be bridged, culverted, or otherwise designed to prevent the restriction of expected flood flows;
- iv. Road fill shall be properly stabilized and maintained during and following construction to prevent erosion;
- v. Road fill shall be made in a manner that minimizes encroachment of heavy equipment within waters of the U.S., (including adjacent wetlands) that lie outside the lateral boundaries of the fill itself;
- vi. Vegetative disturbance in waters of the U.S. shall be kept to a minimum;
- vii. Road crossings shall not disrupt the migration or other movement of those species of aquatic life inhabiting the water body;
- viii. Borrow material shall be taken from upland sources whenever feasible;
- ix. The discharge shall not take, or jeopardize the continued existence of a threatened or endangered species as defined under the Endangered Species Act, or adversely modify or destroy the critical habitat of such species;
- x. Discharges into breeding and nesting areas for migratory waterfowl, spawning areas, and wetlands shall be avoided if practical alternatives exist;
- xi. The road fill shall not be located in the proximity of a public water supply intake;
- xii. The discharge shall not occur in areas of concentrated shellfish production;
- xiii. The discharge shall not occur in a component of the National Wild and Scenic River System;
- xiv. The road fill shall consist of suitable material free from toxic materials in toxic amounts;
- xv. All temporary fills shall be removed in their entirety and the area restored to its original elevation.

## **Letter 1 - Army Corps of Engineers-Ralph Thompson (COE-RT) Forest Service Response**

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### **Forest Service Response to COE-RT-1**

Your comment on the need to obtain a 401 permit under the Clean Water Act is noted. At this time we do not intend to pursue a 404 Permit under the silvicultural exemption. We will obtain all other necessary permits prior to implementation of the project.

### **Forest Service Response to COE-RT-2**

Your comment on the regulatory definition of a wetland is noted.

### **Forest Service Response to COE-RT-3**

Your comment on the definition of navigable waters is noted.

### **Forest Service Response to COE-RT-4**

Your comment on the silvicultural activities that are exempt from regulation under the Clean Water Act is noted. Thank you for enclosing the BMPs.

### **Forest Service Response to COE-RT-5**

Your interpretation of the length of road on wetlands and acres of wetlands impacted is correct. However, the number of Class II and III stream crossings has been changed to "from 3 to 13" in the Final EIS. This is due to additional minor adjustments in road routes and additional field surveys.

### **Forest Service Response to COE-RT-6**

Your comments on the potential need for DA permits are noted.

### **Forest Service Response to COE-RT-7**

Section 10 of the Rivers and Harbors Act of 189 (33 U.S.C. 403) has been included in Chapter 1 of the FEIS.

### **Forest Service Response to COE-RT-8**

Copies of the TES and Wetland Resource Reports and of the two dive surveys were forwarded to your office on August 8, 2000, as requested.

### **Forest Service Response to COE-RT-9**

Additional site-specific information on the rationale for not avoiding wetlands has been added to the road cards for the locations you mention. Also see our responses to COE-RT-10, COE-RT-11, and COE-RT-12.

### **Forest Service Response to COE-RT-10**

Your agreement with our recommendation that the intersection of Road 1000-500 and Road 10 be moved north to avoid impacts to a wetland if practicable is noted. As stated in the road cards, wetlands were avoided where practical during the preliminary road layouts that are shown on the cards. Further adjustments to road alignments are made at the time of final layout. In this case, additional field checking of the area of concern was conducted during fall 2000. Based on that review, it appeared that moving the intersection north would require Road 1000-500 to make too steep of a climb up the slope to Unit V-71.

The practicality of moving this road will be considered again during final road layout. It should be noted that the wetland mapping shown on the road cards is approximate, especially relative to forested wetlands, which represent the majority of wetlands crossed. Similarly, contour mapping shown on road cards does not always accurately reflect the ground. For these reasons, final road routing needs to be done in the field, balancing the need to avoid wetlands with the need to avoid steeper slopes and longer road lengths.

### **Forest Service Response to COE-RT-11**

Your suggestion that Road 1010 could be moved a few hundred feet southwest to avoid impacts to wetlands was field verified in the fall of 2000. It was discovered that the road did avoid the wetland and that the mapping was not accurate in this area.



**Forest Service Response to COE-RT-12**

Your suggestion that Road 1020 could be moved upslope to avoid impacts to wetlands was field verified in the fall of 2000. It was determined that this was not practical. Moving this road upslope would significantly increase the road's sideslope and the threat of downhill soil movement (erosion).



DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, ALASKA  
P.O. BOX 898  
ANCHORAGE, ALASKA 99506-0898

AUGUST 03 2000

REPLY TO  
ATTENTION OF:

Regulatory Branch  
East Section  
9-2000-0802

Richard Cozby, Team Leader  
Attn: Madan EIS  
USDA Forest Service  
Wrangell Ranger District  
Tongass National Forest  
P.O. Box 51  
Wrangell, Alaska 99929-0051

Dear Mr. Cozby:

The U.S. Army Corps of Engineers, Alaska District (Corps) is providing this letter as written comment on the draft Environmental Impact Statement (dEIS) for the Madan Timber Sale. The proposal involves approximately 2.2 miles of permanent and temporary roads constructed in 13 acres of wetlands with one stream crossing; and construction of two new log transfer facilities (LTF). The proposed project is located in the Gypsy Creek, Glacier Creek, Jenkins Cove and Moose Creek Drainages near Wrangell, Alaska.

COE-JS-1

The Corps' regulatory authorities are based on two laws. Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 USC 403) prohibits the obstruction or alteration of navigable waters of the United States (U.S.) without a permit from the Corps. Section 404 of the Clean Water Act (CWA) (33 USC 1344) prohibits the discharge of dredged or fill material into waters of the U.S., including wetlands, without a Department of the Army (DA) permit. Based on information provided in the dEIS, and available to our office, portions of the proposed work would occur in wetlands and waters that are under the Corps' regulatory jurisdiction.

COE-JS-2

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include "muskegs", swamps, marshes, bogs, and similar areas.

COE-JS-3

Normal silviculture activities for the harvesting of forest products, which are part of an established, ongoing operation, are not subject to regulation under Section 404 of the CWA (33 CFR 323.4 (a)(1)(i) and (a)(1)(ii)). To fall under this exemption, the activities must not result in a conversion of an area of the waters of the U.S. to a use to which it was not previously subject, whereby the flow or circulation of waters of the U.S. may be impaired or the reach of such waters reduced (33 CFR 323.4 (b)). A conversion of a wetland to a non-wetland to bring a new area into timber production that is not currently part of an ongoing operation is a change in use of an area of waters of the U.S. that would not be exempt from Section 404 requirements.

The construction or maintenance of forest roads used for the sole purpose of silvicultural activities is exempt from regulation under Section 404 of the CWA (33 CFR 323.4(a)(6)), provided the roads are constructed and maintained in accordance with Best Management Practices (BMPs). The use of BMPs assure that flow and circulation patterns and chemical and biological characteristics of

waters of the U.S. are not impaired; that the reach of the waters of the U.S. is not reduced; and that any adverse effect on the aquatic environment is otherwise minimized. Please recognize that the forest road exemption applies only to roads that would be used solely for normal silvicultural activities, such as harvesting of trees. Forest roads that would remain open and that would provide more than incidental use for subsistence or recreational access, or other public use, would not be considered sole purpose roads and would not be exempt from Section 404 requirements.

COE-JS-3  
(cont)

In conjunction with the issuance of the Notice of Intent, the Corps would appreciate receiving preliminary wetland mapping for each of the project areas which has been prepared in accordance with the 1987 Corps manual. To facilitate the Corps' determination of permit requirements and the applicability of any exemptions, pertinent project features such as roads, bridges, staging and yarding areas, and other proposed project components that could impact waters of the U.S. should be overlain onto the wetlands maps.

COE-JS-4

DA authorization is required for activities associated with many timber sales (e.g., LTF construction, float camps, rafting areas, land based logging camps constructed in wetlands, non-exempt forest roads), and the submittal of a complete DA permit application, including detailed drawings accurately showing all project components that would occur in waters of the U.S., including wetlands, is required. Impacts to waters of the U.S. should be a major consideration during your review of alternatives with regard to both meeting the BMPs and for those project components that would require Section 10 of the RHA of 1899, and/or Section 404 of the CWA authorization.

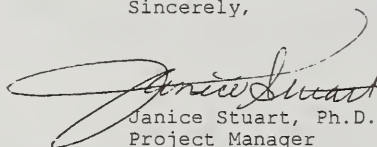
COE-JS-5

For proposals to discharge fill material in waters of the U.S., Corps permits are available only for projects that clearly demonstrate compliance with the Environmental Protection Agency (EPA) Section 404(b)(1) guidelines (40 CFR 230). The guidelines state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, as long as the alternative does not have other significant adverse environmental consequences. In those cases where the activity associated with a discharge is not water dependent, practicable alternatives are presumed to exist unless clearly demonstrated otherwise. The burden is on the applicant to provide a detailed and verifiable discussion of alternatives for our consideration. An alternative is considered practicable if it is available and capable of being accomplished after taking into consideration costs, existing technology, and logistics in light of overall project purpose.

COE-JS-6

The Corps appreciates that opportunity to comment on the proposed Madan Timber Sale. Please contact me at (907) 753-2720, toll free in Alaska at (800) 478-2712, email [jan.f.stuart@poa02.usace.army.mil](mailto:jan.f.stuart@poa02.usace.army.mil), or by mail at the address above, if you have questions.

Sincerely,

  
Janice Stuart, Ph.D.  
Project Manager

Enclosures



## **Letter 2 - Army Corps of Engineers-Janice Stuart (COE-JS)**

### **Forest Service Response**

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#### **Forest Service Response to COE-JS-1**

Your comment on the need to obtain a 404 permit under the Clean Water Act is noted.

#### **Forest Service Response to COE-JS-2**

Your comment on the definition of a wetland is noted.

#### **Forest Service Response to COE-JS-3**

Your comment explaining under what circumstances silvicultural practices are not subject to regulation under Section 404 of the Clean Water Act is noted. We currently consider this project exempt of a 404 Permit.

#### **Forest Service Response to COE-JS-4**

Wetland maps for the project area have been mailed as requested.

#### **Forest Service Response to COE-JS-5**

Your comment that detailed drawings accurately showing all project components that would occur in waters of the US, including wetlands, are required as part of the DA permit application is noted.

#### **Forest Service Response to COE-JS-6**

Your comment on Section 404 (b) (d) guidelines concerning the discharge of dredged or fill materials is noted. A reasonable range of alternatives has been presented for consideration through the NEPA process. Additional information can be provided through the permitting process. This project will comply with the terms of the permit process.

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## United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
1689 C. Street, Room 119  
Anchorage, Alaska 99501-5126

ER 00/0470

August 10, 2000

Mr. Richard Cozby  
Team Leader, Madan EIS  
USDA Forest Service  
P.O. Box 51  
Wrangell, Alaska 99929

Dear Mr. Cozby:

The Department of the Interior has reviewed the May 2000 Draft Environmental Impact Statement (EIS) for the Madan Timber Sale near Wrangell Island, Alaska. Our comments on the Draft EIS, which are outlined below, relate to the following topics: range of alternatives, old-growth habitat (distribution, conversion, disturbance, and fragmentation), LTF sites, brown bear habitat, road management, wetlands, deer habitat, marten habitat, Queen Charlotte goshawk, bald eagles, fisheries, unit cards, road cards, and restoration. We request that these comments be addressed in the Final EIS.

### PROJECT DESCRIPTION

As outlined in the Draft EIS, the U.S. Forest Service (USFS), Tongass National Forest, proposes to harvest between 19 and 32 million board feet (MMBF) of timber, which would total 1,352 to 2,105 acres, and to construct up to 21 miles of new road, including three miles of temporary road. Associated with this project is the construction of up to two log transfer facilities (LTFs) at Jenkins Cove and one near the mouth of Moose Creek. The project area is located on the mainland about six miles east of the town of Wrangell in Southeast Alaska. The project area is approximately 43,000 acres in size and includes Virginia Lake and Mill Creek (in the north), Madan Bay (in the southwest), and Moose Creek (in the southeast). Currently, the project area is roadless and no LTFs exist. Past timber harvest has been limited to a 34-acre unit near the mouth of Moose Creek. Two small old-growth reserves (OGRs) are in the project area, one north of Virginia Lake in Value Comparison Unit (VCU) 502 and one in VCU 504, between Madan Bay and Moose Creek.

### RANGE OF ALTERNATIVES

USDI-1

The Draft EIS "Purpose and Needs" identifies "Issue Number 4" as access management, and considers two options: 1) leaving most roads open after harvest and storm-proofing them, or 2)



closing most roads after harvest, using either barrier berms or placing roads in storage. The proposed project area consists of 69,757 acres of roadless National Forest (Maden, Roadless Area 204). While a helicopter-only alternative was briefly considered in the Draft EIS, it was dismissed because "Beyond 1 mile, helicopter yarding is generally not economical." We believe that a helicopter-only alternative should be fully analyzed as a reasonable alternative in the Final EIS<sup>1</sup>. Similarly, we believe that the Final EIS needs to analyze the impacts of road-construction on possible future land uses in the project area.

USDI-1  
Cont.

## OLD-GROWTH HABITAT

We are concerned about the cumulative effects of the Proposed Action Alternative (Alternative 2), Preferred Alternative (Alternative 3), and Alternatives 4, and 5, when viewed in combination with the amount of high volume strata proposed for timber harvest and the associated construction of roads in a mainland area that is currently unroaded. Issues we believe should be further addressed in the Final EIS include: 1) geographic distribution of proposed and future timber harvests; 2) disturbance regime; 3) conversion of large, contiguous areas of high volume strata to second growth; and 4) fragmentation of remaining old-growth blocks and corridors. These issues are discussed individually below, along with suggestions on how to address these concerns.

USDI-2

Geographic distribution of timber harvest. The Preferred Alternative proposes to clear-cut harvest approximately 775 acres (45 percent of total harvest acres) within the 0- to 800-foot elevation band (Draft EIS Appendix B, Unit Cards). At the landscape level, the proposed cutting is a disproportionate harvest in this elevation class. Forested areas below 800 feet contain the most valuable old-growth habitats for many wildlife species. In particular, habitats below 800 feet have the highest capability for supporting Sitka black-tailed deer (Schoen and Kirchhoff 1990). Schoen and Kirchhoff (1985) reported a mean elevation of 720 feet for wintering deer during a low snow winter and 450 feet during a deep snow winter. Low elevation old growth is used almost exclusively by deer during the winter, especially when snowfall accumulations are high (Suring et al., 1992). The amount of timber harvest at the lower elevations is an important consideration for deer and other species needing habitat cover during the winter (Draft EIS Chapter 3, page 68). Old-growth habitat in this elevation class would be substantially reduced by the proposed timber harvest. Even in unharvested areas, deep-snow conditions can result in high deer mortality. We recommend that the USFS not differentially cut low elevation (0-800 feet), high volume old-growth, and that this be addressed in the Final EIS.

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<sup>1</sup>In the case of Friends of the Bitterroot, Inc. v. U.S. Forest Service, No. CV-90-76-BU, 25 E.L.R. 21186 (D. Mt. 1994) regarding the EIS for the Trail Creek timber sale, the court held that National Environmental Policy Act compliance was not met because the agency did not fully consider all reasonable alternatives. Seven alternatives were identified in the Trail Creek EIS, but the court found that the one reasonable alternative that would have protected and preserved the roadless nature of the area was not adequately considered.

USDI-3

Disturbance regime. The selection of a silvicultural system for any given stand should be based in part on the natural disturbance regime of individual sites to accommodate the effects of future natural disturbances as they interact with the neighboring managed stands (Swanson and Franklin 1992). The predominant cause of natural disturbance in the project area is wind. The high frequency, low-intensity disturbance regime typically affects individual trees or small patches of trees (Alaback 1993, Harris 1989). The amount and size of proposed clear-cut harvest units in the project area appear to exceed the amount of disturbance that would be expected through natural disturbance. Clear-cutting differs from natural disturbances in that it represents a large-scale change (up to 100 or more acres) rather than dispersed small (1 to 20 acres) partial blowdown patches. Timber harvest using even-aged management has the potential to shift ecosystem conditions (at the project level) away from the natural range of wind disturbance (USDA Forest Service 1997b). The most significant human disturbances affecting the current project landscape condition are timber harvest and road construction (USDA Forest Service 1997b). Patterning management after natural disturbance regimes is a tenet of ecosystem management. Therefore, consistent with TLMP, we recommend that forest management practices more closely emulate patterns of natural disturbance and that this be reflected in the Final EIS.

USDI-4

Conversion of large contiguous areas to second growth. We do not believe even-aged harvest methods, such as clear-cutting, provides suitable vertical forest stand structure, species composition, and/or connectivity at the project level. Even-aged timber harvest in the project area would remove high-volume, mature timber stands that provide important wildlife habitat, and would place the second-growth stands into the same ecological time frame. Ecologically, understory production is reduced to extremely low levels when the conifer canopy closes at about age 20 to 30 years, and remains extremely low for at least the next 100 years. After 20 years, the tree overstory begins to close, which decreases the amount of light reaching the forest floor and results in a rapid reduction of understory biomass. Even-aged forests (30 to 150 years old) produce the least understory vegetation (Alaback 1984). Because of the amount of productive old growth changed to early seral vegetation in Alternatives 2, 3, 4, and 5 (Draft EIS Table 2-1, Page 2-17), we recommend that the USFS use alternatives to clear-cutting, which is consistent with TLMP, and that this preference be included in the Final EIS.

USDI-5

Old-growth fragmentation. We believe residual old growth in the project area and its location in relation to artificial and natural openings in the forest is important for maintaining biodiversity. It is crucial to consider the spatial arrangement of unmanaged-forested areas relative to roads, harvested areas, beaches, and natural openings in the forest. Connectivity among old-growth blocks is an important component of a landscape conservation strategy (Kiestler and Eckhardt 1994, Lidicker 1995). Interior, or core, old-growth refers to those acres that are sufficiently buffered from these openings that conditions such as air temperature, moisture, understory composition, windspeed, and amount of sunlight are unaffected by the conditions in the openings (USDA Forest Service 1997). Core old-growth is distinct from "edge" old-growth, where the structure of the canopy may be similar to that found in the core, but the nearness to openings alters the understory and microclimate conditions (Concannon (1995) and Draft EIS Chapter 3, page 50, sixth paragraph). Natural



fragmentation must be clearly understood before further management-induced fragmentation can be properly evaluated (Kiestler and Eckhardt 1994).

We believe the fragmentation of old-growth habitat as a consequence of timber harvest in VCU 502 and 504 would result in an irretrievable loss of wildlife habitat. The loss of habitat would be compounded by the proposed re-entry harvest schedule of 30 to 60 years. In addition, the loss of habitat would be most prevalent in the 0- to 800-foot elevation range. The habitat loss can be minimized if re-entry is deferred for a period of 250 to 300 years. It is important to maintain connections between blocks of interior old-growth forest and also between geographic areas (Ruggiero et al. 1994). To minimize additional impacts at lower elevations, we recommend that the USFS use, and the Final EIS address, alternatives to clear-cutting in the following units: J-1, J-4, J-5, J-10, J-13, J-30, J-49, J-50, J-53, J-201, J-202, V-56, V-57, V-61, V-64, M-117, M-119, M-123, M-128, and M-135.

Muskegs, alpine areas, rock, and other non-old-growth areas naturally fragment old-growth in the project area. The project area provides connectivity between low-elevation passes, beach fringe, riparian habitat along stream corridors, and the old-growth habitat connecting the Madan OGR to the south and the Virginia Lake OGR to the north. Past timber harvest has been limited to 34 acres (Draft EIS Chapter 1, page 2). No roads have been constructed in the project area. The action alternatives propose to harvest timber and construct roads. Due to the increased fragmentation resulting from the proposed road construction and timber harvest, we believe habitat values in old-growth areas adjacent to harvest units would be reduced, especially for wildlife species that require interior habitat. Increased production and delivery of sediment to fish-bearing streams and decreased water quality are also likely. Therefore, we recommend the Final EIS discuss deferring timber harvest re-entries until monitoring plans are developed and it is determined whether the area is needed as a control area for evaluating the effectiveness of project-wide old-growth habitat areas.

Additional concerns regarding connectivity relate to the potential harvest of state lands within the project area. A portion of the beach buffer in VCU 502, south of Virginia Lake, is owned by the State of Alaska. Our understanding is that the State is planning a timber sale in this area. The ramifications of possible development or logging in terms of OGR criteria (TLMP, Appendix K) should be evaluated. We recommend that the USFS describe, in the Final EIS, these cumulative effects and how such a loss of habitat would be compensated. The beach buffer is meant to act as a connector for old-growth. Therefore, we also recommend that in the Final EIS: (1) alternatives for maintaining connectivity between Virginia Lake Recreation LUD and the beach buffer on USFS land south of the State land be considered and adopted (in compliance with the Tongass Plan Implementation Team policy clarification regarding Landscape Connectivity), and (2) proposed units J-49 and V-61 be deferred from timber harvest until suitable provisions for connectivity in the area are adopted.

USOI-5  
cont.



## LOG TRANSFER FACILITIES

Chapter 2, page 3 of the Draft EIS indicates that one or two LTFs may be built, depending on the alternative. Two new LTFs, one at Jenkins Cove and one at Moose Creek, (VCU 504) are proposed for the Preferred Alternative and Alternatives 2 and 4. Biologists conducted an underwater investigation of the proposed LTF site in Jenkins Cove on July 8, 1997, and an investigation of the proposed site on the west side of Moose Creek on May 15, 1998. The proposed site in Jenkins Cove was found to be too shallow to be acceptable as a LTF site, according to 1985 Alaska Timber Task Force (ATTF) guidelines. The investigative report for Jenkins Cove recommended moving the site toward Eastern Passage and into deeper water. The investigative report of the proposed LTF site on the west side of Moose Creek indicates that this site meets the ATTF guidelines.

USDI-6

Because of concerns with the zone of deposit and potential for impacting productive intertidal and subtidal habitat and herring spawn, we recommend that the LTFs be designed and operated in a manner that allows for direct transfer of logs from land to barge, and that this be addressed in the Final EIS. Transfer of logs to barges may be accomplished with typical log handling equipment where a barge landing is constructed on the shore. We believe this would minimize the adverse impacts of bark discharge, accumulation, shading, crushing of fish egg deposits, and compaction associated with log transfer, rafting, and storage. FWS experience during the past 25 years of underwater surveys on existing LTFs suggests that impacts are minimized where barges are used instead of log rafts. While transfer of logs from land to barges does not eliminate discharges of woody debris, accumulations are substantially less. We further recommend that the Final EIS include an evaluation of the use of both helicopter and shore-based transfer of logs to barges, and specifications for docking facilities.

## BROWN BEAR HABITAT

Brown bear habitat ranges from beaches and estuaries to subalpine and alpine summits and ridges. The low elevation drainage bottoms (below 1,000 feet and classified as Class I anadromous fish streams on maps) provide important bear foraging areas. Late summer is the most critical or limiting period for brown bear survival because bears concentrate in these important foraging areas (Schoen et al., 1989). Drainages in this category within the project area are: Porterfield Creek, Glacier Creek, Gypsy Creek, and Moose Creek. Both Porterfield Creek and the lower portion Glacier Creek are within the proposed Virginia Lake OGR (Draft EIS Chapter 3, page 65). The majority of the Class I stream portion of Gypsy Creek is on state land. Moose Creek is outside of the two proposed OGRs. We recommend that the Final EIS reflect that forested buffers of 500 feet be maintained along all identified bear feeding sites, in accordance with the revised TLMP standards and guidelines (page 4-114). An analysis of unit cards for the Preferred Alternative reveals that some portion of the following harvest units are within the 500-foot buffer of potential brown bear foraging areas:

USDI-7

<u>VCU</u>	<u>HARVEST UNIT</u>
502	V-56 V-61
504	J-1 J-3 J-4 J-5 M-117 M-119 M-123 M-135

USDI-7  
Cont

The 500-foot buffers are not shown or discussed on the applicable unit cards. We recommend that the unit cards include requirements for these buffers, and that brown bear buffers be identified and all applicable unit boundaries adjusted to exclude timber harvest from these buffers.

## ROAD MANAGEMENT

We believe the Final EIS should specify mitigation measures that would be used to minimize the impacts of proposed new roads on wildlife, watersheds, and fish. Construction and use of logging roads would substantially alter the character of the area and degrade its value as fish and wildlife habitat. The TLMP Forest-wide Standards and Guidelines for riparian areas directs that "When stream crossings are required to harvest timber, perform investigations to compare the environmental consequences of road crossings versus yarding corridors, and select the action of least environmental impact." Therefore, we believe that analysis of a helicopter-logging alternative versus the construction of roads with should be conducted and discussed in the Final EIS.

USDI-8

Passage of adult and juvenile fish, and effects of road washouts are also of concern. Information presented in the main body of the Draft EIS and on the road cards (Appendix C) indicates that there are numerous fish stream crossings on the proposed road system. Unfortunately, due to the limited information presented, we are not able to determine with any degree of certainty how fish passage would be affected with implementation of the action alternatives. We recommend that the Final EIS address the issue of fish passage and how to mitigate adverse affects caused by the project.

## WETLANDS

Wetlands serve as important wildlife habitat. The Draft EIS (page 3-113), states that between 0.6 and 39.4 acres of wetlands would be directly impacted by road construction, depending on the alternative selected. Table 3-40 indicates that the Proposed Action (Alternative 2) would construct approximately 6.5 miles of new road and impact 39.4 acres of wetlands. The Preferred Alternative (Alternative 3) calls for the construction of 2.2 miles of roads across wetlands and directly impacts 13.3 acres of wetlands. The Draft EIS (Chapter 3, pages 112 and 114) states that all action

USDI-9



USDI-9  
cont

alternatives are expected to have direct impacts on wetlands due to timber harvest and associated activities such as road construction. In keeping with Section 2 of Executive Order 11990 regarding avoidance of new construction in wetlands, we recommend that the USFS seek alternatives to constructing roads through wetlands and address these alternatives in the Final EIS as part of the suggested "helicopter-only" logging alternative. We further recommend that the feasibility of using aerial systems to transport logs from all sale units to transport barges be investigated and addressed in the Final EIS.

## DEER HABITAT

USDI-10

Sitka black-tailed deer receive the highest sport hunting and subsistence use of any terrestrial species in the project area. Residents from Wrangell are the primary subsistence users of the area, followed by Petersburg residents (Tongass Resource Use Cooperative Survey). The quantity and quality of winter habitat is considered the most limiting factor for Sitka black-tailed deer (TLMP). Low elevation, high volume, old-growth forest has the highest habitat value because it intercepts snow and provides understory forage plants. Following logging, lack of snow interception in the early successional stages and lack of forage in middle successional stages reduces the value of these forest stages as deer habitat. The quality of deer winter range would decline in VCUs 502 and 504. These changes are due to timber harvest activities converting old-growth habitat to second-growth forest and increased hunter access from roads (USDA Forest Service 1997b). We recommend that harvest units be carefully planned to minimize the degradation of high-value wildlife habitat, old-growth blocks, and migration corridors, and that this be further discussed in the Final EIS. Techniques used may include avoiding or minimizing road construction by using helicopter yarding and utilization of innovative timber harvest prescriptions to reduce opening sizes and maintain forest structure across the landscape, as well as within the stand.

We are concerned with harvest units J-3, J-42, J-50, J-201, and J-202 in Alternatives 3 and 4. Although the prescription for these units is high retention post harvest (70 percent), these units are located in high-value deer winter habitat. The Jenkins Cove area provides the best low elevation, high-value winter habitat (Draft EIS Chapter 3, page 71). Harvest of 25 to 30 percent of the stand every 40 to 60 years would still result in a reduction of the quality of deer winter range within the project area.

We understand the dilemma of assessing the habitat suitability value of units containing retention trees, and that using a clear-cut habitat suitability score may not reflect the full value of these units as deer habitat. A retrospective analysis of harvested areas within Southeast Alaska (Kirchhoff and Thomson 1998) suggests that structure retained within a clear-cut does little or nothing to enhance the immediate value of the area for deer. We recommend that the deer habitat suitability index values for proposed retention units discussed in the EIS be the same as clear-cut units, unless harvested openings are less than 0.2 hectares, as recommended by Kirchhoff and Thomson (1998).



## MARTEN HABITAT

The Draft EIS (Chapter 3, page 67) states that the project area has approximately 7,509 acres of "high probability marten habitat." Harvest of high volume strata below 1,500 feet with a prescription that has 70 percent retention would reduce the value of habitat below the threshold of what is considered in the Draft EIS to be marten habitat. We recommend that harvest prescriptions in the Final EIS be designed to ensure that habitat value remain above the threshold specified to retain high volume habitat.

Although no roads currently exist in the project area, low levels of trapping occur, mostly along the shoreline. Large marten populations occur in areas having restricted human access, such as this roadless area. We believe marten population reduction in the project area would result from timber harvest and road access. We recommend that alternative road effects be minimized by administrative regulations, such as closing the road system to motorized vehicles, and that this should be discussed in the Final EIS.

We also recommend, where possible, retention of trees, snags, and logs greater than 80 centimeters in diameter. These features should be retained in clumps distributed throughout the harvest units. The size and arrangement of retained forest patches within the harvest units should reflect a balance between relatively large size trees for wind-firmness and smaller sized trees, which would increase the number of retained patches (Schumacher 1999). Wilbert (1992) and Ruggiero et al. (1998) found that martens selected denning and resting habitat in plots about 30 meters in diameter; therefore, we recommend that retained forest patches be a minimum of that size. However, larger patches would be more wind-firm and have greater potential as marten habitat over time. We believe these issues should be further analyzed in the Final EIS.

## QUEEN CHARLOTTE GOSHAWK

The Draft EIS states that one confirmed goshawk nest was located in the Madan OGR. The FWS recommends continuing annual goshawk surveys in all units included in the proposed or selected alternative until harvest in those units is imminent. The FWS also recommends dropping, deferring, or modifying (to meet the appropriate TLMP standards and guidelines) units where goshawk nesting is confirmed. Both of these recommendations should be included in the Final EIS.

Depiction of circular goshawk nest buffers on publically-distributed maps could result in nest vandalism. Therefore, FWS recommends against publication and/or public distribution of maps in the Final EIS that show known goshawk nest sites.

## BALD EAGLES

Proposed development should follow the conservation measures contained in the Bald Eagle Conservation Interagency Agreement between the USFS and the FWS. The proposed Moose Creek LTF and road would be near the site of bald eagle nest #19. This nest was not found during a 1998

USDI-13

Cont.

FWS survey and is likely gone. However, the Bald Eagle Interagency Agreement requires the 330-foot radius management zone to be maintained even though a nest becomes inactive or is lost for any reason. Encroachment within 330 feet of a former nest location would require a variance to the terms of the Interagency Agreement. FWS recommends that all shoreline areas affected by road construction, timber harvest, camps, and LTF sites be surveyed to determine the location and status of eagle nests, and that the results be discussed in the Final EIS.

## FISHERIES

We recommend that a roadless, helicopter-only logging alternative, which would minimize the adverse effects to fish populations and fish habitat in the project area, be included in the Final EIS. We further recommend that the Final EIS include for each alternative, a road management plan which addresses the potential for erosion and details of long-term maintenance following project completion.

USDI-14

We believe permanent road crossings need to be constructed and maintained to adequately allow both juvenile and adult fish passage. Therefore, we recommend that (1) construction of roads through terrain identified as having a high potential for erosion and excessive sediment delivery to fish habitat be avoided where other alternatives reasonably exist; (2) road cards include Best Management Practices (BMPs); and (3) stream crossing structures, specific to channel type, be included in the BMPs.

We also recommend that the Final EIS include a detailed monitoring plan to follow the post-harvest integrity of hill slopes, roads, stream crossing structures and downstream fish habitat that may be adversely affected by the failure of applicable standards and guides to protect fish habitat and water quality.

To determine the potential effects of the proposed project on anadromous and resident fish stocks, we recommend that the Final EIS include a complete inventory of all fish stocks known to inhabit the project area. Information on fish stocks should include monitoring in the project area and adjacent lands where fish stocks are likely to be affected by proposed timber harvest and road construction activities.

## UNIT CARDS

USDI-15

Portions of the unit card information appear to be incomplete. While the map detail and scale are adequate, none of the unit cards show any locations of landings. We believe that the direction in the cards should be clear and specific. We recommend that specific information, such as landing locations and fish passage structures for juvenile and adult fish, be shown and stated on the unit cards, as applicable, to facilitate resource review.

## ROAD CARDS

In Draft EIS Appendix C, Road Cards, it appears that roads were laid out to the harvest units without wetland considerations. Roads appear to be routed through wetlands, even where contours and topography seem to offer opportunities to avoid or minimize impacts to wetlands. It appears that the section of Road 1020 between harvest unit J-30 to harvest unit J-31 could be rerouted to the southwest to avoid impacting the wetland area occurring between the two units. The section of Road 1050 between harvest units V-64 and V-111, V-97 and V-78, could be realigned to avoid additional impacts to wetlands. We recommend modifying road alignments in the Final EIS to minimize impacts to wetlands.

USD I-16

## RESTORATION

We recommend that the Final EIS include maps of the project area that identify previously harvested areas, including dates of harvest, present condition, and any potential or needed restoration (placement of land back into a natural condition or state of productivity). We believe the Final EIS would benefit from a detailed discussion of restoration potential both in the project area and on adjacent lands.

USD I-17

## SPECIFIC COMMENTS

Summary, page S-1, third paragraph. The paragraph states that the Madan OGR is in VCU 502 and the Virginia Lake OGR is in VCU 504. The Madan OGR is in VCU 504 and the Virginia Lake OGR is in VCU 502. We recommend that this paragraph be corrected in the Final EIS.

USD I-18

Summary, page S-5, fourth paragraph. The patch cut prescription calls for retention of "safe" snags. We recommend that the term "safe" be defined in the Final EIS.

USD I-19

Chapter 1, Project Area, page 2, second paragraph. The paragraph states that State lands occur along Mill Creek and at the west end of Virginia Lake. The State lands are shown on Figure 1-2 and not on Figure 2-1, as stated in the paragraph. We recommend that this be corrected in the Final EIS.

USD I-20

Chapter 3, page 36, third paragraph. It is unclear what individual tree selection means. This harvest method can be interpreted as a percent of the number of trees in the unit or basal area. Table 3-8 for all alternatives identifies acres for individual tree selection harvest. Selection harvests range from 25 percent to 30 percent. A selection harvest of 25 percent may be too high when using number of trees in the unit as criteria for the removal of selected trees. We recommend that this be clarified in the Final EIS.

USD I-21

Chapter 3, page 57, Table 3-18. The total acres of clear-cut harvest for Alternative 4 should be changed in the Final EIS from 203 to 283 acres.

USD I-22



- USDI-23 | Chapter 3, page 61, last paragraph. We recommend that the effects of road access through the Virginia Lake OGR in terms of TLMP OGR criteria, be evaluated and discussed in the Final EIS.
- USDI-24 | Chapter 3, page 65. A narrative on brown bear is provided on this page; however, brown bear are not listed in Chapter 8 and Appendix E. We recommend that in the Final EIS, brown bear be included in the Index and Appendix E.
- USDI-25 | Chapter 3, page 91, Landslides. The Final EIS should include a map of existing landslide disturbances and a discussion of areas in the project area with evidence of past landslides.
- USDI-26 | Chapter 3, page 112, Alternatives Comparison. The statement "less than 0.5 acre of wetlands would be directly impacted by road construction under any of the alternatives...." is inconsistent with information in Table 3-40, page 3-113. The largest impact on wetlands from roads, according to the table, occurs under Alternative 2 (Proposed Alternative, 39.4 acres), followed by Alternative 5 (36 acres), and then Alternative 3 (Preferred Alternative, 13.3 acres). Alternative 4 impacts approximately 0.6 acres of wetlands. We recommend that this discrepancy be corrected in the Final EIS.
- USDI-27 | Appendix C, page C-2. Road Card for Road Number 10 (page 1 of 2) includes Harvest Unit J-52 under Alternative 2. Harvest Unit J-52 is not a unit considered for harvest under Alternative 2. We recommend that in the Final EIS this harvest unit be removed from the Road Card to eliminate confusion. We also recommend that State land boundaries be identified on Road Cards, as appropriate, in the Final EIS.
- USDI-28 | Appendix C, page C-16. Harvest Unit J-4 is shown on Road Card Number 1010. This unit is not included under Alternative 2. We recommend that in the Final EIS, this harvest unit be removed from the Road Card to eliminate confusion.

## CONCLUSION

- USDI-29 | We believe that alternatives 2, 5, 3, and 4 (listed in order of magnitude) would have the most negative impact on biodiversity and old growth habitat. We recommend including detailed analysis of a helicopter-only access alternative in the Final EIS that would meet the project's purpose and need to allow timber harvest, and also preserve the roadless quality of the project area. If a roaded alternative is selected in the Record of Decision, an alternative less intrusive to fish and wildlife habitat, such as Alternative 4, with a smaller timber harvest, less clear-cutting, and fewer miles of road (permanent and temporary) is preferable. To better maintain connectivity and dispersal habitat, we recommend that partial harvest methods other than clearcuts be employed in most units. We also recommend avoiding construction of LTFs with low-angle ramp design. If the decision is made to construct a barge loading facility, we recommend removing the rock ramp and bulkhead after completion of the project.

We appreciate the opportunity to comment on the Draft EIS for this proposed timber sale. Please contact Fish and Wildlife Service biologist Richard Enriquez (907-586-7021), if you have any questions concerning these comments.

Sincerely,

A handwritten signature in black ink that reads "Pamela Bergmann". The script is cursive and fluid, with the first name and last name clearly legible.

Pamela Bergmann  
Regional Environmental Officer - Alaska

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## **Letter 3 - U.S. Department of the Interior (USDI) Forest Service Response**

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### **Forest Service Response to USDI-1**

Your comment that a helicopter-only alternative should be fully analyzed is noted. Please note that a helicopter-only alternative was more than "briefly considered" in the Draft EIS. It was, in fact, analyzed in greater detail in the FEIS than it was in the DEIS. Also refer to response to ADGC-9.

### **Forest Service Response to USDI-2**

The preferred alternative does not propose to clearcut harvest approximately 775 acres (45 percent of the harvest) within the 0- to 800-foot elevation band. Instead, it proposes to clearcut harvest approximately 381 acres within this elevation band. In addition, less than 10 acres of patch cut harvest unit would be within this elevation band. This is a first entry into the Madan project area, so harvesting some lower elevation lands is to be expected. Harvesting more higher-elevation forest would require more road building to reach higher-elevation stands and/or more reliance on even-aged harvest methods in visually sensitive areas. Therefore, this approach was not chosen.

### **Forest Service Response to USDI-3**

The Forest Plan does not require that all harvest openings mimic natural disturbances in size and impacts. Clearcutting with reserves is one of a range of harvest practices permitted under the Forest Plan, as is individual and group selection harvest, which are also used extensively in the proposed harvest plan. Approximately 27 percent of the harvest unit acres in the preferred alternative would be clearcut and approximately 14 percent would be small patch cuts. Approximately 59 percent of the harvest unit acres would use individual or group selection methods. These systems more closely mimic natural conditions caused by wind events that blow down individual trees or small groups of trees than does clearcutting. Refer to Table 3-8, Proposed Silviculture Prescription and Logging Systems and the Record of Decision (ROD).

### **Forest Service Response to USDI-4**

Your comment that you do not believe that even-aged harvest methods, such as clearcutting, provide suitable habitat and that the Forest Service should use alternatives to clearcutting is noted. See the Forest Plan EIS for a discussion of the impacts and benefits of this harvest system. As discussed above, clearcutting with reserves is one of a range of harvest practices permitted under the Forest Plan, as is individual and group selection harvest. Clearcutting with reserves is an even-aged system (Chapter 3 of the Final EIS). This prescription calls for at least 10 percent of the stand to be retained as a biological legacy to improve structural and biological diversity in the new stand. In addition, the majority of the acres harvested under the preferred alternative would use individual or group selection harvest methods. These represent uneven-aged systems. Refer to Table 3-8 in the Final EIS.

### **Forest Service Response to USDI-5**

We agree that providing old growth habitat and connectivity between areas of old growth is important. That is why the effects on old-growth habitat and connectivity are evaluated in detail in the Wildlife Habitats and Species Composition section (see subsections on Old Growth Forest, Forest Fragmentation, Wildlife Corridors, and Old Growth Habitat Reserves). Many of the points you make in this comment are relevant at the Forest Plan stage, not the individual project stage. For example, it is beyond the scope of this EIS to address deferring future entries that would occur many years in the future and that would require their own NEPA process if/when they are proposed. This EIS and ROD do not make any decisions regarding specifically when the next entries would occur.

The Forest Plan has implemented a comprehensive strategy for long-term viability of species. A system of old growth reserves and connective habitat, such as the beach fringe, is part of that strategy. This project implements that strategy. As part of this project, the two old-growth reserves within the project area would be significantly increased in size over the minimums, in order to take advantage of higher quality habitat and improved connectivity, relative to the original versions. These modifications were made with substantial input from a number of resource agencies, especially the U.S. Fish and Wildlife Service. As you note in your letter, only 34 acres within the project area have been harvested and no roads have been

built. The preferred alternative proposes harvest on less than 5 percent of the project area, most of this using single tree and group selection. Based on these factors and on the analysis documented in the Final EIS, we do not agree that this would have a significant adverse effect on connectivity.

Your comment that the state owns land in VCU 502 is correct (see Figure 1-3, of the Final EIS). Although it has been considered, we have no information that the state is currently planning to harvest timber on these lands in the reasonably foreseeable future. The State develops a five-year sale plan every year and at this point they have no projects proposed on the mainland within this parcel. Furthermore, the amount of suitable timber on state lands south of Mill Creek (which is the only area where harvest is likely to be influenced by the Madan project) is minor relative to the size of the Madan project area.

#### **Forest Service Response to USDI-6**

The LTF site at Jenkins Cove was moved toward Eastern Passage into deeper water as you indicated. This relocated site is the one evaluated in both the Draft and Final EIS.

Your comment that there should be direct transfer of logs from land to barge is noted. Note that the proposed LTF site near Jenkins Cove is not the one you refer to in your comment, but in fact, the proposed site has been moved into deeper water (see Figure D-1 in Appendix D). While the Draft EIS does not allow for a land to barge operation, the Final EIS has been modified to recognize that both land to barge and land to water operations are acceptable and possible (see Chapter 2 and Appendix D).

#### **Forest Service Response to USDI-7**

Your comment that 500-foot forested buffers should be maintained along all identified bear feeding sites is noted. However, please note that the Forest Plan standards and guidelines do not require a 500-foot buffer "along all identified bear feeding sites," but rather only where "additional protective measures are needed to provide cover among brown bears while feeding, or between brown bears and humans." These are considered especially important on Class I anadromous fish streams where a large amount of bear feeding activity on salmon occurs. Based on our site-specific evaluation, no sites requiring additional protective measures for brown bears, within 500 feet of harvest units, were identified. In addition, please note that only 2 of the 10 units you identified are within 500 feet of anadromous fish streams. This was a joint determination made by Alaska Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and USDA Forest Service biologists.

#### **Forest Service Response to USDI-8**

Your comment that a helicopter logging alternative be considered in order to avoid impacts to fish passage is noted. See the response to USDI-1 above. In addition, information in the main body of the Final EIS and on the road cards does not indicate that "there are numerous fish stream crossings on the proposed road system" as your comment indicates. In fact, the preferred alternative only has six fish stream crossings, and those are over Class II resident fish streams. No anadromous fish streams are crossed by any of the alternatives. See Table 3-41 and the associated subsection titled "Physical Migration Barriers." As indicated in this subsection, all Class II stream crossings will be designed for fish passage. Additional information on stream crossings has been included in the road cards in the Final EIS.

#### **Forest Service Response to USDI-9**

Your comment that a helicopter logging alternative be considered in order to avoid impacts to wetlands is noted. See the response to USDI-1 above.

Also, please consider the fact that a very high proportion of the forested landscape in Southeast Alaska is considered wetland. Although wetlands were avoided to a high degree during preliminary road layout, it is virtually impossible to avoid all of them without significantly increasing road length and building more roads on steeper slopes, thus impacting other resources. We have tried to balance resource effects and display a range of alternatives in order to analyze the different effects.

#### **Forest Service Response to USDI-10**

Your comment that harvest units be carefully planned to limit impacts to high-value wildlife habitat, old-growth blocks, and migration corridors is noted. We believe that this has been done. As noted above, the



old-growth reserves would be expanded and connective corridors, such as the beach fringe and riparian areas, would be protected.

Your reference to Jenkins Cove providing the best low elevation, high value winter habitat is incorrect. The Final EIS notes that "the largest block of high quality deer habitat occurs along the eastern side of Madan Bay." This is some distance from Jenkins Cove and most of it is protected by inclusion in the Madan Old-Growth Habitat Reserve. A large proportion of the remainder, including much of what is adjacent to Jenkins Cove, is protected within the 1,000-foot beach fringe. See Figure 3-21 of the Final EIS for a pictorial display of this.

Treating areas with individual and group selection prescriptions as if they had been clearcut in the habitat capability models, is far too conservative and unrealistic. We believe the method we used to estimate habitat capability after harvest is more reflective of the expected effects, in that it is based on the amount of volume left behind.

#### **Forest Service Response to USDI-11**

Your comments regarding marten habitat and recommending road closures are noted. We do not agree that retaining 70 percent of the commercial volume plus the non-merchantable trees would degrade habitat in most cases to below the threshold considered to provide any marten habitat value; however, we used this as a worst case assumption for the purpose of estimating effects on marten. We recognize that timber harvest will have some site-specific negative effects on wildlife species that prefer older forest. The Forest Plan and this Final EIS recognize that effects will occur on a site-specific basis. We have attempted to reduce those effects through modified harvest systems and mitigation measures. The extensive amount of retention with the proposed harvest will produce much more structurally complex stands in the future, compared with past harvest methods.

The options of leaving roads open or closed were analyzed in the Draft EIS and are analyzed in the Final EIS.

#### **Forest Service Response to USDI-12**

Your recommendations that surveys for goshawks continue in all harvest units until harvest is imminent and that those units with confirmed nests be dropped or modified are noted. Analysis of several years of goshawk calling efforts indicates that it is an inefficient technique for locating goshawk nests in the absence of any previous knowledge of goshawk presence in the vicinity. Based on Regional direction for goshawk surveys, we will continue to survey areas where goshawk activity has been reported. If goshawk nests are located, they will be protected by standards and guidelines in the Forest Plan, as noted in the Final EIS. Your recommendation that the location of goshawk nest buffers should not be published is noted. Goshawk nest sites were not identified on any maps in the Draft EIS or in the Final EIS.

#### **Forest Service Response to USDI-13**

A discussion of eagle nest survey results was included in Chapter 3 of the Final EIS. Your comments regarding a variance to the terms of the Interagency Agreement is noted. Prior to any operations, a survey to locate nest #19 will be conducted. If the nest cannot be located, the historical location will be identified as closely as possible and used to determine the 330' buffer. A variance will be pursued if development activities encroach on this buffer.

#### **Forest Service Response to USDI-14**

Your recommendation for a roadless, helicopter-only alternative to minimize adverse effects to fish populations and fish habitat is noted. Please refer to our responses to USDI-1 and USDI-8 above. All alternatives considered in detail minimize adverse impacts to fish populations and fish habitat through implementation of Best Management Practices and Forest Plan standards and guidelines. We anticipate that any adverse effects to fisheries will be short-term, minor, and localized.

Road Management Options A and B are described in Chapter 2 as well as Appendix F of the Final EIS. Specific details are provided in each road card explaining where and how roads will be "closed" and what erosion control measures will be implemented. Also, regular road inspections and hand road maintenance crew will be implemented to avoid adverse impacts to water quality and fish habitat.



All roads crossing fish streams will be designed and constructed to provide fish passage in accordance with Forest Plan standards and guidelines. Your recommendations are noted as follows: (1) All alternatives avoid terrain with high potential for erosion and excessive sediment delivery to fish habitat. For example, a road originally planned for the east side of Moose Creek was dropped from all alternatives because of the high frequency of avalanche paths through this area and its proximity to fish habitat. Wherever other alternatives reasonably exist, road location avoids unstable slopes and stream crossings. (2) Both the Draft EIS and the Final EIS road cards include site-specific information on Best Management Practices under the site-specific design criteria sections. (3) We have revised the Final EIS road cards to include more site-specific information on stream crossing sites and probable drainage structures.

Appendix G of the Draft EIS (and Final EIS) discusses project monitoring. The two monitoring efforts most relevant to your comment include focused BMP implementation monitoring and Management Indicator Species (resident fish) monitoring, which have been added to the Final EIS. Both of these monitoring efforts are coordinated as components of Forest Plan monitoring.

Fish stocks within the project area are described in the Final EIS, Chapter 3 under the Watershed and Fish Resources section. The Madan Watershed and Fisheries Resource Report (Gagner, 1999) contains greater detail on the watershed and fish resources of the project area.

#### **Forest Service Response to USDI-15**

Your comment that the unit cards should show landings and fish passage structures is noted. Locations of landings have been added to the unit card maps. Note that these are potential landings and that locations may be modified and/or landings may be added based on final unit layout. Once the final landing locations are determined, a Changed Condition Analysis will be conducted and any additional environmental effects not previously identified will be addressed. Locations and types of fish passage structures along with more detailed information on stream crossings are shown on the road cards.

#### **Forest Service Response to USDI-16**

When one examines the road cards relative to road routing through wetlands, it is important to consider that many factors affect routing, in addition to the location of wetlands. One of the most significant factors is where the units are located that need to be accessed. In many cases, units include large areas mapped as forested wetland, so it is impossible to avoid wetlands while accessing these units. In many other cases, the alternative to going through wetlands is traversing a steeper slope or developing a significantly longer road to go around wetlands. Routing the road through wetlands often results in the lowest overall impact. There are many other factors that need to be considered. As stated in the road cards, wetlands were avoided where practical during the preliminary road layouts that are shown on the cards. In this case, additional field checking of several areas of concern was conducted during fall 2000. See responses to comments COE-RT-10, COE-RT-11, and COE-RT-12.

Further, it should be noted that the wetland mapping shown on the road cards is approximate, especially relative to forested wetlands, which represent the majority of wetlands crossed.

#### **Forest Service Response to USDI-17**

As noted on page 1-4 of the Final EIS, only one small (34-acre) harvest unit exists in the project area and it is located just east of the mouth of Moose Creek. This unit was beach-logged in 1959.

#### **Forest Service Response to USDI-18**

The error on page S-1 of the Draft EIS concerning the location of Old Growth Reserves has been corrected in the Final EIS.

#### **Forest Service Response to USDI-19**

A safe snag is one that is not considered to be dangerous to fellers and other workers in the harvest unit. Specific criteria are as defined in the reserve tree guidelines of the Forest Service (see Final EIS, page 2-4).

#### **Forest Service Response to USDI-20**

State lands are shown on Figure 1-2, of the Final EIS. State lands are also shown on Figures 2-2 through 2-5 and on Figure 1-2 and Figure 1-3, as well as on almost every other map in the EIS.

**Forest Service Response to USDI-21**

As stated in the explanation of uneven-aged systems (Chapter 3 of the Final EIS), 25 to 30 percent of the merchantable volume would be removed from the stand by selecting individual trees and small groups of trees for harvest. This would likely result in 70 to 75 percent of the merchantable trees being left in the stand after harvest. Non-merchantable trees would also be left in the stand. We do not agree that removing 25 to 30 percent of the merchantable trees in a stand is too high to meet the visual quality objectives (VQOs) on visible slopes within the Scenic Viewshed. The objective would be to meet the VQOs by leaving a range of size classes. This would result in a stand with a high level of structural diversity and small openings for new trees to grow. Such a stand would blend in well with the existing diverse stands within the viewshed.

**Forest Service Response to USDI-22**

The total acres of clearcut harvest in Alternative #4 is incorrect in Table 3-21. It has been changed to 283 acres in the Final EIS.

**Forest Service Response to USDI-23**

Your request that the potential road through the Virginia Lake Old Growth Reserve be evaluated and discussed in this EIS is noted. During interagency meetings, we discussed the possibility of a future road through this reserve but there were no suggestions to move the reserve as a result of this possibility. None of the proposed alternatives include a road within either old-growth reserve. When and if such a road is considered, an appropriate NEPA document will evaluate it.

**Forest Service Response to USDI-24**

Brown bear will be added to Chapter 8 (the index) as you suggest. No site-specific measures for brown bear are included in Appendix E because the project is not expected to have a significant effect on brown bears (see Chapter 3, Issue #3, Wildlife Habitats and Species of Concern of the Final EIS). This was a joint determination made by Alaska Fish and Wildlife, U.S. Fish and Wildlife Service, and USDA Forest Service biologists.

**Forest Service Response to USDI-25**

Unstable soils (including landslides) are discussed in the unit cards. Locations are also mapped on unit cards in the Final EIS. More detailed information is located on field forms located in the project planning record.

**Forest Service Response to USDI-26**

The Alternative Comparison section intent is to point out the acres of palustrine emergent acres that would be impacted. While this is still true (less than 0.5 ac.) The total number of wetland acres impacted from road construction is estimated at 39.4 in Alternative #2. The Selected Alternative will impact an estimated 39.0 acres. Table 3-46 illustrates the FEIS alternatives and Table ROD-3 of the ROD illustrates the Selected Alternative's effects on wetlands.

**Forest Service Response to USDI-27**

Unit J-52 should not be displayed on Road Card 10 in the Alternative #2 proposal and it has been removed in the Final EIS.

**Forest Service Response to USDI-28**

Unit J-4 should not be displayed on Road Card 1010 in Alternative #2 proposal and it has been removed in the Final EIS.

**Forest Service Response to USDI-29**

Your comment that Alternatives 2, 5, 3, and 4 (listed in order of magnitude) would have the most negative impacts on biodiversity is noted. See the responses to USDI-5 and USDI-10. Your recommendation that a helicopter-only alternative be considered is noted. See the response to USDI-1 and ADGC-9. Your comment that partial harvest methods other than clearcutting be employed in most units is noted. As discussed above, most of the area in harvest units in the Selected Alternative is by single tree and group selection. Your recommendation that we avoid constructing LTFs with low-angle ramp design and to remove road ramps and bulkheads if constructed are noted.





# Southeast Alaska Conservation Council

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August 15, 2000

Richard Cozby, Team Leader  
Attn: Madan EIS  
USDA Forest Service  
PO Box 51  
Wrangell, AK 99929

Re: Comments on Madan Timber Sale DEIS

SENT VIA FAX, EMAIL & MAIL

Dear Mr. Cozby:

The following comments are submitted on behalf of the Southeast Alaska Conservation Council (SEACC) on the Madan Timber Sale Draft Environmental Impact Statement (DEIS).

SEACC is a coalition of eighteen volunteer conservation groups in fourteen communities across Southeast Alaska, from Yakutat to Ketchikan. SEACC's individual members include Alaska Natives, subsistence users, commercial and sport fishermen, hunters and guides, tourism and recreation business owners, small timber operators and high value-added wood product manufacturers, as well as concerned citizens from all walks of life. SEACC is dedicated to safeguarding the integrity of Southeast Alaska's unsurpassed natural environment while providing for balanced, sustainable use of our region's resources.

## THE DEIS FAILS TO EVALUATE A REASONABLE RANGE OF ALTERNATIVES.

SEACC-1

NEPA requires that the Forest Service consider a reasonable range of alternatives for the proposed timber sale. See 40 C.F.R. § 1502.14(a). Unfortunately, the agency only considered action alternatives which contemplated logging either 19, 21 or 32 mmbf, and treated the no-action alternative primarily as a benchmark. The agency should have given serious consideration to an alternative which relied solely on selection logging and helicopter transfer to barges, or at least evaluated another alternative which logged less than 19 mmbf of timber.

ALASKA SOCIETY OF AMERICAN FOREST DWELLERS, Point Baker • ALASKANS FOR JUNEAU • CHICHAGOF CONSERVATION COUNCIL, Tenakee • CUSTOMARY & TRADITIONAL GATHERING COUNCIL OF KAKE • FRIENDS OF BERNERS BAY, Juneau • FRIENDS OF GLACIER BAY, Gustavus • JUNEAU AUDUBON SOCIETY • LYNN CANAL CONSERVATION, Haines • LISIANSKI INLET RESOURCE COUNCIL, Pelican • NARROWS CONSERVATION COALITION, Petersburg • PRINCE OF WALES CONSERVATION LEAGUE, Craig • SIERRA CLUB, JUNEAU GROUP • SITKA CONSERVATION SOCIETY • TAKU CONSERVATION SOCIETY, Juneau • TONGASS CONSERVATION SOCIETY, Ketchikan • WRANGELL RESOURCE COUNCIL • YAKUTAT RESOURCE CONSERVATION COUNCIL



## **ANALYSES OF ELIMINATED ALTERNATIVES ARE NOT INCLUDED IN THE DEIS.**

The DEIS does not provide enough detail about the eliminated alternatives to determine whether or not the Forest Service adequately analyzed a full range of options. In discussing the Helicopter Only alternative, for example, the DEIS states that "it fails to adequately meet Forest Plan direction in terms of the management options it provides." (DEIS at 2-7) The agency must specifically relate each eliminated alternative to the Forest Plan direction, and detail the rational for exclusion based on management implications.

SEACC-2

## **THE DEIS SHOULD FULLY DESCRIBE AND JUSTIFY LOGGING PRESCRIPTIONS.**

While the cutting method for each unit is described on the unit cards, the DEIS must detail why the agency chose specific prescriptions for each unit. If other, non-preferred alternatives determine that non-clearcutting logging methods are most appropriate for a unit, such as individual/group selection via helicopter for 1,192 acres in Alternative 4 (DEIS at 3-37), the preferred alternative should not reverse the agency's recommendation and prescribe clearcutting.

SEACC-3

## **THE DEIS MUST RE-EVALUATE ROADBUILDING AND ACCESS MANAGMENT OPTIONS.**

Options A, B, and a range thereof were to be considered for the roads proposed in the DEIS. Instead, the agency has applied only full access or full closure to the roads. Such an "either-or" choice hardly provides the agency with a meaningful range of opportunities. Nor do such options provide the public with a meaningful opportunity to comment on the full range of impacts of the proposed roadbuilding.

SEACC-4

If the option to build permanent roads and leave them open for use after finishing the proposed Madan sale is selected, the Forest Service must fully analyze the cumulative effects from this choice, because it establishes the infrastructure for subsequent entry into the project area. Future developments options in the project area are retained in all Alternatives, (DEIS at S-8), and so the agency must treat all future roadbuilding and road usage activities as reasonably foreseeable and document the cumulative impacts to the forest resources from that level of development.

## **THE FOREST SERVICE MUST AWAIT THE CONCLUSION OF THE ROADLESS AREA RULE BEFORE APPROVING ANY NEW ROAD CONSTRUCTION IN ROADLESS AREAS.**

SEACC-5

The Forest Service is currently conducting NEPA process for a federal rulemaking relating to the protection of roadless areas across the National Forest system, including possibly the Tongass. NEPA prohibits agencies from committing "resources prejudicing selection of an alternative before making a final decision." 40 C.F.R. § 1502.2(f). Thus, before making a final decision on whether or not to protect roadless areas in Madan through the roadless area rule, the Forest

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SEACC-5  
cont.

Service cannot select an alternative that allows roadbuilding there, because doing so would prejudice the final decision on the roadless rule and EIS. See 40 C.F.R. § 1506.1(c)(3). The Forest Service must therefore await the completion of the roadless area rule before approving any road construction in the project area.

**THE DEIS FAILS TO ADEQUATELY SHOW THAT THE AGENCY IS EXEMPT FROM SECTION 404 OF THE CLEAN WATER ACT.**

To be exempt from the permit requirements, the agency must show that the proposed activities satisfy the requirements of the 404 exemptions and avoid the exception to the exemptions (also known as the "recapture" provision). United States v. Akers, 785 F.2d 814, 819 (9th Cir. 1986). The Forest Service fails to meet its burden of proof that it is exempt from Section 404 permit requirements.

SEACC-6

In order to qualify under the "normal silviculture" exemption, the proposed activities "must be part of an established ... silvicultural, ... operation..." 33 C.F.R. § 323.4(a)(1)(ii). Alternatives B and D call for logging and roadbuilding in a currently unlogged, unroaded area. Because these alternatives will bring "an area into silvicultural use" and will "change the use of the land," the Forest Service is not entitled to a Section 404(f)(1)(A) exemption. The fact that part of this area was classified for timber production in the modified TLMP, as well as in previous Tongass Plans, does not satisfy this statutory requirement. Programmatic EISs do not irretrievably commit forest plans to a particular use. Such action must wait until a site-specific evaluation is completed under NEPA. This area cannot, therefore, be part of an "established...silvicultural...operation" until after a timber sale has been conducted.

To qualify for the "forest roads" exemption, the Forest Service must also assure that road building activities are conducted in accordance with Best Management Practices (BMPs). The agency must establish that the BMPs will "assure that flow and circulation patterns and chemical and biological characteristics of the navigable waters are not impaired, that the reach of the navigable waters is not reduced, and that any adverse effect of the aquatic environment will be otherwise minimized." See 33 U.S.C. § 1344(f)(1)(E); see also 33 C.F.R. § 323.4(a)(6).

The DEIS reports that "the BMPs 'assure that flow and circulation patterns and chemical and biological characteristics of water...are not impaired, that the reach of the waters...is not reduced, and that any adverse effect on the aquatic environment will otherwise be minimized'" (3-109). Absent from the DEIS, however, is any information or analysis showing that the implementation of these BMPs will actually assure the maintenance or enhancement of flow, circulation, or reach of navigable waters within the project area, including wetlands. In fact, the Forest Service lacks any credible scientific basis for establishing that agency BMPs will in fact accomplish the statutory requirements that would entitle them to this exemption. According to the 1998 Tongass Monitoring Report, "[c]urrently, the Tongass NF does not have an approved method to evaluate the effectiveness of BMPs related to impacts of management activities to wetland functions and values." See Tongass National Forest: Annual Monitoring and Evaluation Report for Fiscal Year 1998 at p. 85 (hereinafter USFS FY98). The report goes on to

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acknowledge that the agency's evaluation of the effectiveness of the standards and guidelines adopted in the revised Tongass Plan for minimizing impacts to wetlands and their associated functions and values is "inconclusive." Id. at 87.

More recently, a team of Forest Service watershed specialists has come up with a list of "thoughts and recommendations for addressing this monitoring question" but the "evaluation of the effectiveness [the] Standards and Guidelines on wetland functions and values is still in progress." See Tongass National Forest: Annual Monitoring and Evaluation Report for Fiscal Year 1999 at pp. 115, 117 (hereinafter USFS FY99). Furthermore, the USFS FY99 also documents the lack of effectiveness of agency BMPs across the Tongass. The report reveals that over half of 265 Class I crossings with culverts failed to meet fish passage standards. See USFS FY99 at 28. The DEIS provides no supporting evidence that the agency will fully and properly apply these BMPs, or that these measures will effectively maintain the flow, circulation, or reach of affected waters, if implemented properly.

SEACC-6  
cont.

In light of recent findings regarding fish passage problems through Tongass culverts, the agency must document how activities will minimize watershed impacts. How can the agency assure insignificant effects on watersheds or fisheries when the agency's past practices have led to fish passage problems on hundreds of salmon streams? To comply with NFMA, the Forest Service must show that its management plans will not adversely affect fish habitat:

"No management practices causing detrimental changes in water temperatures or chemical composition, blockages of water courses or deposits of sediment shall be permitted in these areas which seriously affect water conditions or fish habitat."

36 C.F.R. § 219.27(e)

This DEIS does not satisfy the agency's high burden of disclosure.

#### THE FOREST SERVICE MUST COMPLY WITH EXECUTIVE ORDER 11990.

Executive Order 11990 prohibits construction in wetlands where practicable alternatives exist and requires that "all practicable measures" be implemented to minimize harm to wetlands. According to the DEIS, Madan contains a high density of wetlands. Road building will impacts between 0.6 and 39.4 acres of wetlands under Alternatives 2-5 and "roadbuilding would permanently remove wetland habitat" (DEIS at 3-47). According to the DEIS, the action alternatives were developed to address the Purpose and Need for the project. Since the Helicopter-only Alternative was removed, Alternative 1 is the only alternative that does not require road construction across wetlands. The Forest Service must chose it over other alternatives to Executive Order 11990. Given the backlog of timber in already approved sales, the no-action alternative is certainly practicable.

SEACC-7

The DEIS further fails to note whether the construction of new LTFs will impact wetlands. Given that the LTF would be constructed in the intertidal zone, we must assume that some wetlands will

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SEACC-7  
com.

be affected. If any wetlands will be affected by the LTF, the Forest Service must choose an alternative which doesn't require a new LTF, or that adequately minimizes the impact.

**THE DEIS FAILS TO FULLY ANALYZE THE IMPACTS OF FUTURE ROADS ON OLD-GROWTH RESERVES.**

We generally endorse the proposed change in the Virginia Lake Old Growth Reserve (OGR) boundaries. We are particularly pleased to see that the Forest Service has modified the boundaries of the Virginia Lake Old Growth Reserve to include Virginia Lake and the Porterfield and Glacier Creek drainages.

SEACC-8

According to the Forest Plan, one goal of the Old-Growth Habitat LUD is to "[m]aintain areas of old-growth forests and their associated natural ecological processes to provide habitat for old-growth associated resources." Forest Plan at 3-76. The DEIS statement at 3-61 acknowledging the likely potential of future road access through the OGR is of significant concern. The construction of a road through the reserve will fragment the old-growth habitat and degrade the natural ecological processes of the area. Absent from the DEIS, however, are the effects of such a road on the long-term integrity of the reserve.

The objectives of the Old-Growth Habitat LUD include:

- "Provide old-growth forest habitats, in combination with other Land Use Designations, to maintain viable populations of native and desired non-native fish and wildlife species and subspecies that may be closely associated with old-growth forests..."
- "Maintain components of flora and fauna biodiversity and ecological processes associated with old-growth forests..."
- and "To the extent feasible, limit roads, facilities, and permitted uses to those compatible with old-growth forest habitat management objectives."

TMLP at 3-76.

When faced with such an incompatible use in an OGR, the agency must limit such use "to the extent feasible." The Forest Plan defines feasible as:

- "Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, technical, and safety factors. In evaluating feasibility, the following are considerations: 1) the effectiveness and practicality of the measures being considered; and, 2) the long- and short-term costs of the measures and the effect of those costs on long- and short-term economic viability of projects or programs."

TMLP at 7-13.

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The DEIS lacks any analysis of the cumulative impacts from future degradation of OGR habitat values, and this concern must be addressed in the DEIS.

SEACC-8  
Cont.

#### THE DEIS FAILS TO FULLY DISCLOSE AND EVALUATE THE POTENTIAL IMPACTS ON BROWN BEAR POPULATIONS.

The Madan project area is currently home to healthy brown bear populations. TLMP requires the Forest Service to consult with the Alaska Department of Fish and Game in identifying and managing important brown bear foraging sites. It is unclear from the DEIS whether such consultation has taken place recently. It is clear, though, that no information is disclosed which adequately describes such a buffer, or whether or not other mitigation is necessary. If the Forest Service has indeed failed to consult with ADF&G, the agency has violated the Forest Plan, and therefore violated the National Forest Management Act (NFMA).

Two of the activities which present the greatest threat to brown bear populations are road construction and logging within riparian areas important to brown bears. The DEIS fails to fully disclose and evaluate the site-specific and cumulative impacts on brown bears from these two management activities in the Madan Project Area.

##### A. The DEIS Fails to Adequately Disclose and Evaluate Impacts Due to Road Construction.

SEACC-9

All action alternatives propose between 6.7 and 21.3 (DEIS at 3-83) miles of new road construction. According to the 1997 TLMP brown bear panel, "increased roading in brown bear habitat would most likely result in increased mortality due to legal hunting, illegal killing, and defense of life and property," Meade, 1997, p.2. Roads constructed for timber sales increase human access to bear habitat and result in greater mortality to bears. Titus and Beier (1991) found a direct correlation between autumn brown bear kill and cumulative miles of road construction. Even after closure of hunting seasons, mortality continues because of defense of life and property kills and an unknown number of illegal kills (Shoen et al. 1994). The DEIS attempts to downplay these concerns by claiming that based on plans to modify reserves, and implement buffers and a road closure strategy, brown bear populations will sustain minimal effects (DEIS at 3-66).

The 1996 brown bear panel evaluators stated that the Forest Service's "first priority" should be "to retain currently unroaded watersheds in a roadless condition." Iverson, 1996, p.3. Concerned about the impacts of roadbuilding on brown bears, the 1996 TLMP brown bear risk assessment panel said that the Forest Service's "first priority" should be "to retain currently unroaded watersheds in a roadless condition." To meet these concerns, the Forest Service should at least consider an alternative which doesn't build any roads in each of the drainages (Porterfield, Glacier, and Moose Creeks) identified as potential high value foraging habitat. These areas are important unroaded basins in the Project Area and provide key refugia for brown bears. In addition, the conclusion that Glacier and Porterfield Creeks are protected habitat because they are in the proposed Virginia Lake Old Growth Reserve ignores the impact from potential road access construction in this OGR in the future (See DEIS 3-61).

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**B. The DEIS Fails To Fully Disclose and Analyze the Impacts of Logging and Siting Facilities in Important Brown Bear Feeding Areas.**

SEACC-9  
cont. The DEIS states that "[t]he proposed Madan project is expected to have minor, if any, effects on brown bear habitat because this species uses a wide variety of habitats, including clearcuts". (3-66). The 1996 and 1997 TLMP panel recommended a 500 ft default no logging, no roading buffer along anadromous streams important for brown bear foraging. Unfortunately, assuming a 500 ft no logging, no roading buffer as the default, the Forest Plan assumes that important brown bear feeding sites will receive no additional protection unless the need is identified during project planning, and a 500 foot buffer is available. (Forest Plan at 4-114) It is essential that the Forest Service take a conservative approach towards managing potentially important brown bear foraging streams, and fully describe the rationale for logging in brown bear habitat.

In the DEIS, the Forest Service claims that "the most important reaches for anadromous fish in Moose Creek would be maintained within the 1,000-foot beach and estuary buffer" (DEIS at 3-66). All of the alternatives which place units along the Moose Creek utilize a sort yard slated for placement at the creek mouth. None of the maps or unit or road cards provide sufficient detail to determine whether the sort yard will be placed outside the 500 or 1,000-foot buffers. In a recent report, the Unit 4 Brown Bear Management Strategy team recommended that to mitigate impacts of development, operators should "avoid construction of industrial facilities...in areas of seasonal bear concentrations". (Southeast Alaska Unit 4 Brown Bear Management Strategy, June 2000) The DEIS does not reveal what evidence the Forest Service has to suggest that roadbuilding and sustained levels of activity associated with proposed sort yards are sufficiently minimized and that brown bears will not be affected. Otherwise, it must adopt a level of protection sufficient to adequately minimize foraging disturbance on and near Moose Creek and other potential high value foraging areas.

**THE DEIS FAILS TO FOLLOW THE RECOMMENDATIONS OF THE ANADROMOUS FISH HABITAT ASSESSMENT (AFHA) BY FAILING TO CONDUCT A WATERSHED ANALYSIS.**

SEACC-10 The Madan project area contains important anadromous and resident fish streams. These streams are home to coho, chum, and pink salmon, as well as cutthroat trout and Dolly Varden char.

Other than a general sense of which alternatives will have more impact on fisheries and other watershed functions, the effects analysis presented in the DEIS provides very little site-specific analysis of the effects of various alternatives on fisheries and other watershed functions. In order to give decisionmakers and the public a better understanding of the site-specific effects of various alternatives, the agency should complete a cumulative watershed effects analysis, as recommended by AFHA.

The AFHA report concluded that three (3) very important protective measures were needed to ensure fish habitat protection, including "completion of cumulative watershed effects analyses to evaluate natural and human disturbances." *AFHA Report Synthesis* at 14. The report further elaborated that "[m]ore comprehensive watershed analyses comparable to those in the PACFISH

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Strategy, if just applied on priority watersheds where timber will be harvested, will provide for both timber harvest and anadromous fish habitat protection." *Id.* at 15 (emphasis added). This recommendation responded to problems identified recognized by the AFHA team and expert reviewers with the existing project-level planning process, including the failure to:

- thoroughly evaluate potential cumulative watershed effects;
- have sufficient "project-scale inventories for conducting site-specific assessments in sale planning and layout;"
- take a "holistic approach in describing the important watershed functions and processes;"
- take a long-term view of the effect of clearcutting and roading on watershed processes and functions at the landscape scale; and

See AFHA Report, Appendix C, *An Evaluation of the Effectiveness of Current Procedures for Protecting Anadromous Fish Habitat on the Tongass National Forest* 38 (Sept. 1994). These experts concluded that conducting watershed analysis at the front-end of project planning would provide the Forest Service with essential information necessary to adequately protect fish habitat and watershed functions, and updating important resource inventories in a timely manner. *Id.* at 34. The DEIS for this timber sale, however, fails to include a watershed analysis and thus fails to ensure that fish habitat and watershed functions will be protected.

SEACC-10  
Cont.

The recommended cumulative watershed effects analyses called for by AFHA would help the Forest Service determine:

"... how best to manage watersheds with steep unstable slopes, highly productive fisheries, productive timber lands, important and sensitive wildlife resources, high-value recreation and visual resources, cultural resources, and other considerations. ... Watershed analyses would also provide for assessments and management approaches more consistent with site-specific ecological processes and functions, resulting in a systems approach to management."

*AFHA Report Synthesis.* at 12.

The AFHA Fish Habitat Analysis viewed watershed analysis as playing a critical role in providing the essential information needed for implementing the Revised Tongass Plan at the project level.

"Logging system and transportation plans are the primary foundation for current timber-sale project plans. Current planning is often too narrowly focused on the design of individual harvest units and road segments, so the interdisciplinary team has difficulty addressing broad ecosystem management and cumulative effects issues. Current project planning relies heavily on information from reconnaissance resource inventories. Time and resources needed to validate these reconnaissance inventories and to collect site-specific information are often limited during project planning. The practical opportunities for adjusting unit and road designs during layout, to mitigate problems or concerns missed in planning, are somewhat limited. Watershed analysis provides a mechanism to interject essential information on watershed and fish habitat characteristics into the 'front-end' of

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project planning, and also provides a structured framework for updating needed resource inventory information in a timely manner."

SEACC-10  
cont.

APHA, Appendix C, at 38 (emphasis added).

While standards and guidelines may serve to define scope of allowable action, they are no substitute for research and analysis at the watershed level. If the Forest Service had done comparative watershed analyses, then it wouldn't have to rely on imprecise "rules-of-thumb" to determine the effects of proposed actions. Such analyses would also provide the public with an adequate assessment of the impacts of proposed activities on the watersheds.

#### **THE DEIS INSUFFICIENTLY ANALYZES KARST RESOURCES.**

SEACC-11

Given the rarity of karst in the project area (DEIS at 3-89), all of the lands with identified karst resources should be protected. In reviewing the proposed Madan sale area, the Tongass Cave Project found "karst development from alpine to sea level. One of the caves discovered, Phalanges Phreatic Cave, contained significant archeological and paleontological potential". See attached letter from the Tongass Cave Project to Brad Powell (Jan. 19, 1998). The DEIS makes no mention of this cave, despite asserting that detailed surveys were conducted in 1998 and 1999.

Because of the uniqueness of the karst in the project area, road number 2010 should not be constructed and units V-112, V-111, V-97, and V-78 should be dropped from the proposed project plan. We are also very concerned with the effectiveness of mitigation measures for karst, as well as other mitigation listed in Appendix E, and the DEIS fails to discuss mitigation in sufficient detail for the public to evaluate the adequacy of the measures. Mere listing of mitigation techniques is insufficient to satisfy NEPA. "Mitigation must be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated." Carmel-by-the-Sea v. U.S. Department of Transportation, 123 F.3d 1142, 1154 (9<sup>th</sup> Cir. 1997)(citations omitted) In accordance with this ruling, the Forest Service must take a hard look at mitigation now and not wait until after a decision is made.

#### **THE DEIS MUST FULLY ANALYZE ALTERNATIVES TO LOG DUMPS, AND DOCUMENT IMPACTS OF LOG DUMP SITINGS.**

SEACC-12

In addressing log transportation, the Madan DEIS only considered the number and placement of log dumps. The DEIS included no real analysis of different transfer methods, such as barging, or other alternatives to log dumps. Alternatives to log dumps exist, and facility design proposals such as Steve Seley's temporary log transfer facility (see attached) completely avoids in-water dumping, rafting, and discharge from logs as well as minimizing the footprint of necessary structures. In addition, given the documented harm to marine resources associated with bark and other woody debris accumulation, the EIS must detail consideration and justification for choosing log dumps in the Madan area. Dive surveys prepared for the Wrangell District list Jenkins Cove

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and Moose Creek as too shallow to be acceptable as log dump sites, according to the ATTF guidelines. No in-water dumping, rafting, or storage of logs is appropriate for this project.

SEACC-1  
cont.

**THE DEIS FAILS TO ADEQUATELY SHOW THAT THE MADAN TIMBER SALE IS NECESSARY TO MEET MARKET DEMAND FOR TONGASS TIMBER.**

Appendix A of the DEIS states that the market demand for Tongass timber for the next 10 years is expected to be 160 mmbf per year. (DEIS at A-13). This statement fails to accurately describe the demand estimates provided by Brooks and Haynes, which estimates demand for timber over periods shorter than 10 years. For example for FY 2001, the year in which the Forest Service plans to offer timber from Madan, Brooks and Haynes estimates timber demand to be between 96 and 130 mmbf. See Brooks and Haynes, Timber Products Output and Timber Harvests in Alaska: Projections for 1997-2010 (Sept. 1997). The Forest Service must provide a reasoned basis for ignoring the demand estimates of Brooks and Haynes.

The market demand for Tongass timber has been declining (see attached Anchorage Daily News article), and continues to sink. In 1998, 16 major timber sales, such as Dumpy, Clover, and Rowan received no bids (See attached Tongass National Forest Timber Sale Offerings chart). Over the past two fiscal years, only 2/3 of offered Tongass timber was sold. In the first 3 fiscal quarters of 2000, the Forest Service already has a backlog of approximately 50,000 mmbf of timber sold but uncut in this federal year alone. (See attached Timber Cut and Sold table) The DEIS is inadequate because it failed to disclose the backlog of Tongass timber, and address why the Forest Service persists in offering timber to a sunken market.

SEACC-13

The agency can not cite market demand as a purpose and need for the proposed Madan sale. The Forest Service's first obligation remains to manage "all of the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people." 16 U.S.C. § 531(a) (Multiple Use-Sustained Yield Act). Only after complying with this instruction, as well as other applicable laws, should the Forest Service "seek" to meet market demand. If the combination of renewable resources that best meets the needs of the American people protects the roadless areas on the Tongass, like the Madan project area, from commercial logging and roadbuilding, as it clearly does, then Section 101 of the TTRA can not be used to mandate below cost timber harvest on the Tongass.

The DEIS estimates that the majority of timber offered from Madan is hemlock (DEIS at 3-42), but does not state exactly how much hemlock will be sold. The international hemlock market is currently oversupplied and hemlock exports "have collapsed their own market value by the record-breaking low sales prices" (see attached Pacific Rim Wood Market Report, June 2000).

According to the largest private timber land owner in Southeast Alaska:

For a variety of reasons, the timber market in which Sealaska sells its timber -- the Pacific Rim market -- remains glutted, even in the absence of the USFS's timber-dumping program. The market is particularly grim for hemlock ....

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The result is a market that can take no more; indeed, hemlock exports to Japan from North America have already declined by 80% since 1980....

But despite all this, the federal government continues to force-feed the Pacific Rim market with surplus timber.

The inevitable short-term result will be to further depress already eroded timber prices. ....

(Letter from Loescher, President and CEO of Sealaska Corp. to The Honorable Ted Stevens. July 2, 1999)(attached).

The agency's conclusion that more timber from the Tongass is needed now to supply an overly saturated and price-depressed market is simply unreasonable. Instead of preparing and offering below-cost and deficit timber sales from roadless areas, the Forest Service should be investing its scarce resources in offering small sales to local operators off the existing road system.

#### **THE DEIS' ECONOMIC EFFICIENCY ANALYSIS IS INADEQUATE.**

As required by the Forest Service Handbook and the Revised Tongass Plan, the Forest Service performed an economic efficiency analysis for all action alternatives. The economic efficiency analysis is inadequate, however, because the agency failed to compare the total economic benefits of the project to the total economic costs. See FSH 2409.18, chapter 30, 32.32. "Economic costs are the sum of the financial costs, non-market costs, and non-Forest Service costs." Id., sec. 32.24. The FSH further defines "direct" economic costs as including "negative impacts on resources that have an economic value." See id., chapter 10, 13.05.

Unfortunately, the Forest Service never quantified the non-market values or calculated the non-market costs resulting from implementing this project on this currently roadless area. The potential negative economic impacts from the approved project on the scenic, wildlife, and wildland values of the project area, including opportunities for wild lands recreation and nature-based and adventure tourism, are simply not taken into account when evaluating the economic efficiency of this project. The Forest Service violated NEPA because the FEIS fails to ensure appropriate consideration of "presently unquantified environmental amenities and values." See 42 U.S.C. § 4332(2)(B). Analysis presented in the DEIS impairs the fair consideration of the adverse environmental and economic effects of this project by the public and decision maker by only evaluating the economic costs and benefits to the timber sale purchaser and agency.

#### **THE DEIS FAILS TO ADEQUATELY DISCLOSE AND EVALUATE CUMULATIVE & CONNECTED IMPACTS.**

There are several past, present, and reasonably foreseeable and uses in or near the proposed Madan sale area, including the Doughnut Timber Sale on nearby Wrangell Island and state lands development. Nowhere in the DEIS is there any detailed analysis of the specific cumulative effects

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of these management activities to forest resources in the Madan area and the users of those resources. Without such an analysis, the DEIS violates NEPA.


Connected impacts on subsistence uses of the project area must be considered. Although the DEIS states no specific harm to subsistence opportunities due to the proposed Madan sale, what will happen when other places, such as Wrangell Island, become less productive due to development? More subsistence users will be crowded into less area, reducing opportunities for success, and further reducing habitat value. The DEIS must include such concerns in its discussion of impacts on subsistence.

SEACC-15  
cont.

**IN CLOSING**, the Forest Service should more suitably address the relationship between short-term uses such as roading and logging of the Madan project area, and the maintenance and enhancement of long-term habitat, geological, and subsistence values. The usefulness of the DEIS is severely limited because the alternatives and discussions of impacts ignore the wealth of agency information regarding the multiple use benefits of keeping roadless areas intact.

Thank you for accepting these comments.

Best Regards,



Aurah Landau  
Grassroots Organizer

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## **Letter 4 - Southeast Alaska Conservation Council (SEACC) Forest Service Response**

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### **Forest Service Response to SEACC-1**

Your comment that NEPA requires a reasonable range of alternatives to be considered is noted. The Madan EIS does consider a reasonable range of alternatives. The action alternatives include a range of harvest volumes from 19 to 32 MMBF and a range in harvest prescriptions from clearcutting with reserves to small patch cuts to single tree and group selection harvest prescriptions. These methods would remove anywhere from 25 percent to 90 percent of the unit volume. The action alternatives also include extensive use of both helicopter and road-based logging systems. Also, various combinations of these are analyzed in each alternative. For example, in addition to the No Action alternative, which would postpone entry into the entire Madan project area, Alternative 4 would use only helicopter logging with the individual/group selection prescription in the Jenkins Cove area and would not harvest in the Virginia Lake watershed, while Alternative 5 would completely postpone entry into the Moose Creek watershed. Alternatives 2 and 3 expand the range further. In addition, since the DEIS we analyzed a separate Helicopter Only alternative and found it to be much too uneconomical to study in further detail. Refer to Chapter 2 of the FEIS. Also see the responses to USDI-1, SEACC-2 and SEACC-9.

### **Forest Service Response to SEACC-2**

Your comment that the Draft EIS does not include enough detail to determine if a full range of alternatives was considered, such as a helicopter-only alternative is noted. Please see our responses to USDI-1 and ADGC-9 for further explanation. In addition to the five alternatives considered in detail, the FEIS considered a full entry/limited road alternative, a visual/wildlife emphasis with road alternative, a helicopter-only alternative, and a LTF-barge only alternative. The reasons that these were eliminated from detailed study are discussed in Chapter 2 under Alternatives Considered but Eliminated from Detailed Study. We believe that the reasons given in that section adequately explain why these alternatives were eliminated. In regards to the LTF/Barge Only alternative, the Final EIS has been changed somewhat. The LTF/Barge only concept is a permitted concept, should the operator prefer this type of operation; however, the analysis bases the effects and outcomes on an LTF that allows for watering of logs. This is because watering logs is more efficient and because current technology and practices ensure marine resources are adequately protected.

### **Forest Service Response to SEACC-3**

Table 3-8, of the Final EIS does not state that individual/group selection via helicopter is the most appropriate logging system for 1,192 acres. It simply lists that as one of the alternatives being evaluated in the EIS. In those cases where the clearcutting prescription was chosen as the selected harvest method, the reasons were identified in the description of the silvicultural prescriptions on the unit cards.

### **Forest Service Response to SEACC-4**

Your comment that leaving all the roads open or leaving all the roads closed is not a reasonable range of alternatives is noted. However, we believe that this does capture the full appropriate range; it just doesn't identify all possible combinations inside the range. The decision-maker may modify alternatives within the range.

Your comment that future use of roads and road building should be analyzed is also noted. The cumulative effects section includes an analysis of reasonably foreseeable road building and road usage activities as required by NEPA. In addition, since the DEIS a project level as well as a forest level Roads Analysis Plan (RAP) has been completed and is on file in the Planning Record.

### **Forest Service Response to SEACC-5**

Your comment that the Forest Service should wait till rule-making governing roadless areas is completed before making a final decision on the Madan project is noted. The final rule applies immediately to the Tongass National Forest, but adopts a mitigation measure that both assures long-term protection and a smooth transition for forest-dependent communities. The final rule provides that the prohibitions do not apply to the Tongass National Forest where a notice of availability for a draft environmental impact statement (for road building or timber harvest in an inventoried roadless area) has been published in the



Federal Register prior to 1/12/01. The Notice of availability for the Madan Timber Sale draft environmental impact statement was published on 6/23/2000, so this project may proceed pursuant to 36 CFR 294.14(d).

### **Forest Service Response to SEACC-6**

The U.S. Army Corps of Engineers (Corps) has regulatory authority over the discharge of dredged or fill material into waters of the United States, including wetlands, and is responsible for determinations under Section 404 of the Clean Water Act. Section 404(f)(1)(E) of the Clean Water Act provides that the construction or maintenance of forest roads for silvicultural activities is exempt from regulation under the Clean Water Act, provided that the roads are constructed and maintained in accordance with best management practices (BMPs) to ensure that: the flow and circulation of navigable waters are not impaired; that their reach is not reduced; and that any adverse effects will be minimized. The proposed roads would be constructed and maintained in accordance with BMPs. The Forest Service does not intend to seek a 404 Permit.

We acknowledge the concerns that have been identified regarding fish passage through culverts. This statement is true, but should be placed into perspective. The Tongass Monitoring and Evaluation 1999 Report states, "It is important to note that fish do pass through most of the culverts identified in the Red and Gray category most of the year. Most of these culverts do have fish located upstream of them. We are only concerned that passage may not be possible for juvenile fish passage, and it is likely that stronger swimming adult fish are not restricted in most of the structures. The drainage structures assessed in this report for their consistency with current juvenile fish passage standards include drainage structures installed at various times with various fish passage design standards. Therefore, the results should not be necessarily interpreted to conclude that the reason for the specific structure not meeting current standards is due to negligent structure design or intention. This report is not an evaluation of the current management of the Tongass National Forest. It does not assess the effectiveness of the current Forest Plan standards and guidelines."

Habitat assessments, site surveys, drainage structure replacement projects, and a research project are underway to address these concerns throughout the Tongass National Forest. We offer the following responses with respect to the roads planned for the Madan Timber Sale:

1. Fish population sampling throughout the project area focused heavily on proposed road locations, and utilized more reliable methods such as electro-shocking that were not commonly used 10 or more years ago when most of the existing roads on the Tongass were constructed. In fact, several proposed road crossings in the Madan area were checked more than once to ensure that fish populations were verified in reaches with suspected habitat. Therefore, we are more confident today, because we have accurate information on the distribution of anadromous and resident fish populations through the project area.
2. The Madan road system proposes no anadromous fish stream crossings and very few resident fish stream crossings. Due to recent awareness of passage requirements of resident fish and increased emphasis on providing fish passage on resident fish streams, fish passage will be provided at all culverts. Additionally, some of the Class II crossings will be bridges where fish passage is easily achieved. Therefore, the risk of blocking fish migration is inherently low for this project.
3. Additional information on site conditions and proposed drainage structures on fish streams has been included in the Final EIS road cards. All structures would be designed to maintain fish passage in accordance with the Forest Plan, regardless of the fish species in the stream. In the past, resident fish passage was not always required, even where resident fish populations had been verified.
4. A road condition survey would be conducted on all Madan roads as they are completed. The survey would collect information on fish passage to ensure that drainage structure installation meets fish passage standards or identify any maintenance needs to correct problems. In addition, Appendix G (Monitoring Plan) identifies specific roads where fish stream crossings and slope stability are identified as a concern. These locations will be closely monitored.

### **Forest Service Response to SEACC-7**

The Forest Service must take all practicable measures to minimize harm to wetlands from roads and LTFs. See response to USDI-16.

### **Forest Service Response to SEACC-8**

Your comment endorsing the expansion of the Virginia Lake Old-Growth Reserve is noted. There are no reasonably foreseeable plans to build roads in the reserve. Any future road building would require a NEPA analysis and publication of a NEPA document. At this time it is not a reasonably foreseeable action; therefore it is not analyzed in this EIS. Biologists from the Alaska Department of Fish and Game and with the U.S. Fish and Wildlife Service agreed that the expanded reserve was in the best possible location (and was considerably larger than the minimum) even given the remote possibility of a future road through the reserve.

### **Forest Service Response to SEACC-9**

The Forest Service has consulted with the Alaska Department of Fish and Game on brown bear and brown bear foraging areas. Effects to brown bears are disclosed and evaluated in the section on Management Indicator Species (Chapter 3, Issue #2, Wildlife Habitats and Species of Concern in the Final EIS). The need for 500-foot buffers adjacent to any of the proposed Madan harvest units has not been identified.

Moose Creek is not considered an "important seasonal bear concentration" area. There is a barrier to fish close to the mouth of Moose Creek and the creek becomes canyon-like fairly quickly so there is little, if any, foraging habitat above the estuary buffer. Also, the fish runs in that creek are not very large (refer to the Fisheries Resource Report). Lack of fish, lack of large bear concentrations, and lack of foraging areas means this is not one of the "important areas" which would exclude placement of an LTF. Refer to the Wildlife Resource Report for more detail. We do not believe that there would be significant adverse environmental effects to brown bears from locating a sort yard at the mouth of Moose Creek.

### **Forest Service Response to SEACC-10**

The Madan EIS provides an adequate analysis of the potential effects on soils, watershed, and fish resources (Chapter 3 of the Final EIS), to support reasoned decision making. Although there could be advantages to conducting a more detailed watershed analysis within the planning area, early in the planning process we decided that a more detailed watershed analysis was not warranted for the purpose of planning a timber sale in these particular watersheds. A review of the criteria suggested in Appendix J of the Forest Plan (page J2) for conducting a more intensive, complex, and field-based watershed analysis supports this decision. There are no threatened, endangered, or sensitive aquatic species known to inhabit the project area. There is only a negligible amount of second-growth forest younger than 30 years (far less than 20 percent of any major watershed) and there are no roads. Furthermore, the riparian standards and guidelines are applied as described in the Forest Plan, with no modifications requiring justification through watershed analysis.

### **Forest Service Response to SEACC-11**

Your concern about protection of karst and cave resources is noted. The EIS focuses on effects on karst and cave resources; numerous karst and cave resources found in the project area are not discussed in the EIS because the project would not affect them. These areas with high vulnerability ratings were dropped from consideration for units and roads. In addition, Road 2010 and Units V-78, V-97, V-111, and V-112 have been dropped from the preferred alternative, as you recommended. The preferred alternative is not expected to affect other known karst and cave resources because Forest Plan standards and guidelines will be engaged to protect them. Please refer to our response to WRC-3.

### **Forest Service Response to SEACC-12**

With prudent location, design and construction, watering logs is an appropriate and economical method of log transportation in Southeast Alaska. The Madan EIS has taken appropriate measures in the location, design, and survey of the two LTF sites to ensure that the operability of these facilities would provide an environmentally safe and effective log watering operation. The Madan Final EIS would provide for all necessary mitigation and includes all appropriate BMPs to ensure that these operations have no significant effects on marine resources. Mitigation and BMPs are cited in Chapter 2. The analysis pertaining to the



suitability and operability of the LTFs is found in Chapter 3. Additional mitigation can be found in Appendix D.

Both LTF sites were adjusted to respond to concerns expressed by the 1997 U.S. Fish and Wildlife Service dive report. The USFWS stated that "if the facility was moved west toward Eastern Passage into deeper water, it would be suitable for an LTF. We moved the Jenkins Cove site accordingly. We also moved the Moose Creek LTF site from the east to the west side of Moose Creek. The USFWS conducted a dive on the west site in 1998 and recommended it as suitable for an LTF. Both the LTF sites proposed for development meet Forest Plan Appendix G guidelines and were determined to be suitable by the USFWS. All the dive reports are available in the planning record. In addition, Appendix D includes specific Standards and Guidelines which govern the location, design and use of LTFs.

#### **Forest Service Response to SEACC-13**

The need for this sale is addressed in Appendix A of the EIS. Appendix A provides a discussion of the overall demand for Tongass timber in Southeast Alaska and describes the market demand analysis conducted for the Forest Plan. Chapter 1 of the EIS explains how this project relates to the Forest Plan. Note that the supply and demand issues you raise would determine whether timber sales associated with the Madan project are eventually sold or not.

#### **Forest Service Response to SEACC-14**

The balance of resource use necessary to maintain a viable economic and social environment is not established at any one level in forest planning. Rather, the process begins with long-range planning at the national level, and continues down through the regional and forest levels to the project planning level. The Madan EIS is a project-level analysis. It does, however, implement direction provided at higher levels of planning.

The Forest Plan EIS includes a comprehensive analysis of the economic and social environment in Southeast Alaska, the Tongass National Forest, and the communities within these areas. The Economic and Social Environment section of the Forest Plan EIS includes very detailed information on industries directly dependent upon the Forest, including the timber industry and the recreation and tourism industry. This information includes, among other things, 1995 employment data, baseline employment levels projected for the year 2000, and estimated employment and income levels under each alternative on various communities within the Tongass. The Forest Plan EIS concluded that employment in the recreation and tourism industry was expected to increase moderately, and about the same amount, under all alternatives during the first decade, while timber industry employment was expected to decrease under the majority of alternatives, including Alternative 11. The Madan project was designed to implement the Forest Plan, and the EIS prepared for the project tiers to the analysis in the Forest Plan EIS.

With regards to the Madan project specifically, the Forest Service Manual (FSM 1970.6) states, in part, that "the responsible line officer determines the scope, appropriate level, and complexity of economic and social analysis needed." The Madan project is a timber sale project, and was proposed to respond to the goals and objectives identified by the Forest Plan for the timber resource and to help move the project area towards the desired future condition identified by the Forest Plan for the lands within the timber production, modified landscape, and scenic viewshed LUDs.

#### **Forest Service Response to SEACC-15**

Cumulative effects are measured and analyzed within a contiguous watershed or set of contiguous watersheds. No additional reasonably foreseeable projects are scheduled within the Madan Projects set of watersheds. As stated in Chapter 3, the Crittenden Project (FY 07) is located in a separate watershed to the northwest. The only cumulative effects of implementing both projects might be some level of adverse effects on the visual landscape as viewed by airplane traffic. Since there has not been any site specific planning on Crittenden, these effects cannot be identified or measured at this time. The fact that the Department of Natural Resources (DNR) have and continue to manage their timber resources on Wrangell Island was considered in the design of the Madan timber sale. With these design features the Madan Project will meet Partial Retention Visual Quality Objective. No DNR projects are currently scheduled on the mainland.



With regard to subsistence use in the project area, the Madan area has historically had very minimal subsistence use. A public hearing was held on March 14, 2003. No public testimony was given at this hearing. Because full implementation of the Forest Plan is not occurring, no public testimony was received at the subsistence hearing and based on information gathered throughout the Madan planning process, it is our belief that cumulatively there will be no significant possibility of a significant restriction on deer harvest in the Madan Project Area.

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# STATE OF ALASKA

## OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET  
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July 31, 2000

Mr. Dick Cozby, U.S. Forest Service  
Wrangell Ranger District  
P.O. Box 51  
Wrangell, AK 99929-0051

Dear Mr. Cozby:

SUBJECT: MADAN TIMBER SALE DEIS  
State ID No. AK 0006-14JJ  
Proposed Consistency Finding

The Division of Governmental Coordination (DGC) has coordinated the State's review of the U.S. Forest Service's consistency determination for the Madan Timber Sale. The FS found the activity consistent, to the maximum extent practicable, with the Alaska Coastal Management Program (ACMP). The location of the sale includes Virginia Lake and Mill Creek, Madan Bay, and Moose Creek, and is about 6 miles east of Wrangell, Alaska. It encompasses an area of approximately 43,000 acres. Portions of Value Comparison Units (VCUs) 502 and 504 are included in the project area.

Specifically, this sale proposes to harvest between 19 and 32 MMBF of timber from approximately 1,352 to 2,105 acres, and to construct up to 21 miles of road, depending on alternative. In addition, up to two log transfer facilities (LTFs) would be developed, one at Jenkins Cove and one at Moose Creek. These facilities will undergo separate Alaska Coastal Management Program (ACMP) consistency reviews, and will be subject to DEC Certificates of Reasonable Assurance (401 Certifications). The FS has identified Alternative 3 as the Preferred Alternative. This alternative proposes harvest of approximately 19 MMBF of timber from approximately 1,719 acres. Approximately 8 miles of specified roads and 1 mile of temporary roads would be constructed.

This proposed consistency finding, developed under 6 AAC 50, applies to the federal consistency determination required for the project per 15 CFR 930 Subpart C. The State



reviewed the proposed timber harvest activity to determine if state coastal resource concerns are adequately addressed, and to determine if the State agrees that the activity is consistent, to the maximum extent practicable, with the enforceable policies of the ACMP. The State concurs with the FS determination of consistency, provided that the recommendations discussed below are carried out during further project planning and implementation.

### CONSISTENCY FINDING

#### Road Management Options

The "Storage" Road Management Strategy is defined in Attachment 1, Item H of the ACMP MOU:

*"Storage: Remove or bypass all drainage structures to restore natural drainage patterns, add water bars as needed to control runoff, revegetate. This is intended to be the primary maintenance strategy applied on intermittent use roads during their closure cycle. In this strategy, bridges and culverts on live streams are completely removed to restore natural drainage patterns. Cross drains and ditch relief culverts will be bypassed with deep, water bars but left in place to minimize the cost of reusing these roads in the future. Due to the isolated nature of the road system, which makes maintenance costly and difficult, and their frequency of use, storage is the most appropriate strategy for these roads. Maintenance Level 1, closure and basic custodial maintenance, is assigned. Storage eliminates car and truck use, and discourages use by other motor vehicles. This level of maintenance is synonymous with FRPA closed roads."*

ADGL-1

Two post-sale road management options are being considered for this project, and are discussed throughout the DEIS. However, the discussion of the post-sale road management options is confusing primarily due to the use of the terms "stormproofing" and "storage". For example, according to page S-4 of the DEIS, *"Under Option A, most roads would be left open after harvest and stormproofed. There would also be selective road closures for short segments of the system. These roads would be placed in storage with the drainage structures removed. Under Option B, most roads would be closed after harvest, either by barrier berms or by placing the roads in storage. Roads placed in storage would be stormproofed. Storage results in maintaining roads to protect improvements and resource values only"* (emphasis added).

"Stormproofing" and "storage" are two different maintenance strategies that, respectively, equate to the inactive and closed road standards of the Alaska Forest Practices Regulations (11 AAC 95.315(c) and 320). In other words, a road placed in storage could not be stormproofed. Stormproofing involves outsloping the road surface and establishing driveable waterbars and rolling dips with all drainage structures left in place. This strategy requires periodic maintenance for drainage control. Conversely, roads placed in storage are closed by removing all drainage structures on live streams to restore natural drainage patterns, and by installing non-driveable waterbars and revegetating the road bed. When applied, this strategy does not require further maintenance.

It is unclear whether road closure under Option B will involve stormproofing or storage. This confusion also occurs on page 3-94 of the DEIS which states *"Under Road Management Option*

*B, all roads would be closed to motorized traffic after harvest, including 4-wheelers and snow machines, and most would be placed in storage; they would be maintained to the degree necessary to protect improvements and resource values only. Closures would be implemented using berms or drainage structure removal. Roads closed would be stormproofed" (emphases added). It is unclear as to whether the roads will be stormproofed or placed in storage.*

In addition, although this section of the DEIS states that most of the roads would be placed in storage, according to Appendix F (pages F-3 and F-4), 14.98 miles or 77 percent of all roads would be stormproofed under Option B. This appendix also indicates that there is no difference between Options A and B in the total miles of road that will be stormproofed and placed in storage. Under both options, 14.9 miles of road will be stormproofed and 4.3 miles will be placed in storage. The only difference between the two is the berm closure and the application of Maintenance Level 1 to the stormproofed roads under Option B (under Option A, Maintenance Level 2 is applied to stormproofed roads, and the roads are left open). In addition, since drainage structures are left in place under both Maintenance Level 1 and 2, from a practical water quality standpoint, there is no difference between the two options, particularly as they apply to the Madan project area where motorized traffic use under Option A would be minimal. It is difficult to see the utility in presenting two road management options that are essentially the same.

AD6C-1

Cont.

Given that the next potential entry into this project area is not anticipated to occur for another 30 years, the entire road system should be closed and placed in storage, as it unreasonable to assume that it will be effectively maintained over such a long period of time. This is especially true given the fact that the total amount of roads on the Tongass far exceeds the annual funding available to maintain them. Incrementally adding new specified roads such as those proposed for the Madan Timber Sale will only decrease the likelihood that they will be maintained over the long-term. Therefore, a third road management option should be presented to the decision maker, and should be one that simply involves closing the road system and putting it to bed (i.e., outslipping and waterbarring the road surfaces, leaving ditches in a condition suitable to reduce erosion, removing all drainage structures, including bridges, culverts, and their associated fills, and revegetating the road surface and other areas susceptible to erosion). This option would be consistent with the road closure standards of the Alaska Forest Practices Regulations (11 AAC 95.320) and would best ensure the maintenance of water quality over the long-term.

The "storage" Road Management Strategy would also address concerns identified in the document for increased access to wildlife, specifically brown bear and goats.

#### Stream Crossings

Stream Crossing at MP 3.02 of Road Number 10: This crossing site was the only one for which bankfull width and depth were described. According to the road card, a 48-inch diameter culvert is proposed on a Class II stream that has a bankfull width of 12 to 14 feet, and a bankfull depth of 5 feet. However, such a structure is obviously too small for a stream of this size and, in addition to being hydraulically insufficient, would create a velocity barrier to resident fish passage. It would also be inconsistent with 11 AAC 95.305(a)(1) of the Alaska Forest Practices Regulations, which states "a permanent culvert and the adjacent roadway must be constructed to

AD6C-2



pass or withstand the 50 year flood without damage." Consequently, a bridge rather than a culvert should be installed at this crossing site.

ADGL-2  
cont.

The Stream Crossings section on the card for this road also describes a crossing site at MP 2.31 as consisting of two Class III streams, each requiring a 60-inch culvert. It states "*Consider moving crossing down stream where streams have combined into one channel.*" If this is feasible, then it must be done in order to be consistent with 11 AAC 95.285(a)(6), which states "An operator shall minimize the number of stream crossings."

The wording in the "Specified Roads" section of the Unit Card M-123 be changed to "Require oversized culverts to pass debris" since there is evidence of debris avalanche in the channel and the Soils/Wetland/Karst section recommends oversized culverts due to road crossing concerns. In addition, all drainage structures on Road 20 (Moose Creek) should be oversized due to concerns with debris flows. (11 AAC 95.305)

ADGL-3

#### Wildlife Corridor

In order to be consistent with the ACMP, Unit M-135 should avoid harvest within 300 feet of Moose Creek in order to maintain a wildlife corridor along the relatively steep sideslopes, per AS 41.17.060(7).

ADGL-4

#### Information Needs:

##### Unit Cards:

Unit cards are lacking the following information, which should be provided at the DEIS stage according to Attachment 1, item D of the ACMP MOU:

- Estimated location of landings;
- The area and proposed harvest of any known slopes with slope gradient greater than 72 percent;
- A line 300 feet from the bank of anadromous and high value resident fish streams; and
- Any existing harvest units or portions thereof in the area displayed on the unit card map, with year of harvest, where known. [Specifically, Unit M-135]
- Road and landing location on slopes that are greater than 67%, unstable, or slide-prone; and
- Where known, site-specific erosion control prevention measures to address slope instability due to road construction.

ADGL-5

##### Appendix C -- Road Cards:

Attachment 1, item E of the ACMP MOU contains road card information which should be provided at the DEIS stage for timber sales.

ADGL-6

Overall, the road cards for this DEIS present some useful information. However, unlike many recent Stikine Area road cards, the site-specific stream crossings section of the cards lacks information regarding bankfull width and depth, channel type, and the incision depth at each

ADGL-7



ADGC-7  
cont.

ADGC-8

crossing site. This information is essential for evaluating the adequacy of the size and types of crossing structures being proposed. In addition, for the most part, site-specific information is presented only for those crossings that involve a bridge or a culvert greater than or equal to 48-inches in diameter. Consequently, only a limited number of Class II and Class III stream crossings are described, and no information is provided regarding smaller Class III and Class IV stream crossings. If available, the road cards for the FEIS should include site-specific information for all Class III stream crossings, and for those Class IV crossings that require a culvert at least 36-inches in diameter. In addition to the stream gradient (upstream and down) and substrate type, this information should include the maximum width, maximum depth, bankfull width and depth, the channel type, and the incision depth at each crossing site.

Elevation.

If you do not concur with this proposed consistency finding, you must notify DGC by 5:00 p.m. on the fifth calendar day after you receive it. Within that five-day period, you may either:

- (1) Request an extension of the review schedule pursuant to 6 AAC 50.110(b)(8) if you need more time to consider this finding; or
- (2) Request that the State review this finding. To do this, submit a written statement requesting "elevation" of the finding, describe your concerns, and propose an alternative consistency finding. This alternative finding must demonstrate how your project is consistent with the ACMP standards and district policies I cited in this letter.

Other review participants with elevation rights pursuant to 6 AAC 50.075(a) may also request an elevation by submitting the information required in (2) above to DGC by 5:00 p.m. on the fifth calendar day after they receive the proposed finding. The review process may be expedited if the proponent and all review participants with elevation rights notify DGC of their concurrence as soon as possible.

If DGC does not receive a request for extension or an elevation statement from you or any other review participant with elevation rights, DGC will issue this proposed consistency finding as a final consistency finding.

Advisories.

Please be advised that although the State agrees the project is consistent with the ACMP, based on your project description and any alternative measures contained herein, you are still required to meet all applicable State and federal laws and regulations.

This consistency finding may include reference to specific laws and regulations, but this in no way precludes your responsibility to comply with all other applicable State and federal laws and regulations.

July 31, 2000

This consistency finding is ONLY for the activity as described. If you propose changes to the approved activity, including its intended use, prior to or during its siting, construction, or operation, you must contact this office immediately to determine if further review and approval of the revised project is necessary. Changes may require amendments to this consistency finding.

If the proposed activities reveal cultural or paleontological resources, please stop any work that would disturb such resources and immediately contact the State Historic Preservation Office (907-269-8720) so that consultation per section 106 of the National Historic Preservation Act may proceed.

NEPA comments have been attached to this finding. If you have any questions regarding this process, please contact me at 907-465-3177 or email [Jennifer\\_Garland@gov.state.ak.us](mailto:Jennifer_Garland@gov.state.ak.us).

Sincerely,



Jennifer R. Garland  
Project Review Coordinator

Cc:

\*\* Kevin Hanley, DEC, Juneau  
\*\* Jim Cariello, DFG, Petersburg  
\*\* Lana Shea Flanders, DFG, Juneau  
\*\* Jim Eleazer, DNR/DOF, Juneau  
\*\* Rex Blazer, DGC, Juneau

\*\*=email transmission

## CWA SECTION 319 AND NEPA COMMENTS

Alternatives Considered

Given the undeveloped roadless character of the Madan Timber Sale project area, and the concerns that were identified for maintaining scenic quality and recreation values along the Back Channel, we feel that a strictly helicopter to barge alternative would be appropriate for this project. In addition to maintaining the roadless character of the area, such an alternative would minimize the amount of soil disturbance and the potential for water quality degradation, and would avoid the impacts from bark deposition associated with the use of conventional in-water log transfer facilities.

ADGC-9 According to the DEIS (page 2-7), a helicopter-only alternative was considered for the project but was eliminated from detailed study because *"it fails to adequately meet Forest Plan direction in terms of the management options it provides."* However, it is difficult to understand how such an alternative would fail to do this, especially since only a small portion (8 percent) of the project area is designated as a Timber Production LUD. It is also difficult to understand why the development of a road system is deemed necessary during this initial entry, since the DEIS (page 3-44) states that *"The Forest Service does not have any other timber activities planned for the Madan Project Area in the foreseeable future"* and assumes that *"there would be about 30 years between harvests"* (page 2-15).

Consequently, the FEIS should better explain why a much more environmentally preferred helicopter-only alternative was eliminated from further consideration, and why a road infrastructure is needed at this time when the next potential entry won't occur for perhaps another 30 years. Without such an explanation, it would appear that the primary long-term purpose of the road system is to provide for motorized and non-motorized recreation, which may disqualify it for permitting exemption under Section 404(f)(1) of the Clean Water Act.

While a helicopter-only alternative is preferable in terms of minimizing overall resource impacts, Alternatives 3 and 4 were designed to minimize the amount of road construction and stream crossings, and involve the extensive use of helicopter yarding and silvicultural prescriptions that retain 60 to 70 percent of the stand within harvest units. Specifically, clearcutting comprises only 22 percent of the acres to be harvested under Alternative 3, and only 16 percent of the acres under Alternative 4. In addition, Class II and Class III stream crossings are minimized under both alternatives, with only one Class II crossing under Alternative 3, and no fish-bearing stream crossings under Alternative 4. Therefore, given that a helicopter-only alternative is not being considered, we highly recommend that either Alternative 3 or 4 be selected for the Record of Decision for this project.

Wildlife Corridors

ADGC-10 The discussion on pages 3-58 and 59 inadequately describe the impacts of the preferred alternative on wildlife corridors. While the document mentions that Units M-156 & M-161 may



restrict the Moose Creek travel corridor, it ignores the cumulative impacts of Units M-119, M-123 and the operation of the sortyard and LTF on wildlife movements. It also fails to discuss the potential movement of wildlife to Wrangell Island across the marine area known as "the narrows" (approximately 1000 feet across) and the impact that fragmentation of the Moose Creek travel corridor may have upon movement through this area.

ADGL-10  
cont.

The document states on page 3-73: "The project is not expected to have significant effects on mountain goat winter habitat....Timber harvest in the area east of the upper reaches of Moose Creek could potentially have a minor effect on goat winter habitat." However, the Unit Card for M-123 states that "No field review has been done for that portion east of Moose Creek" and Unit M-127, immediately upslope of the unit, has been identified as mountain goat winter range. We recommend additional wildlife surveys be conducted in both of these units to identify critical goat winter range and travel corridors.

ADGL-11

We recommend deleting that portion of Unit M-123 east of Moose Creek for the following reasons:

ADGL-12

- soil concerns;
- inadequate field verification;
- possible damage to Class II riparian area from yarding; and
- fragmentation of a wildlife corridor between Moose Creek and a lower elevation pass to Virginia Lake;

The wildlife discussion of the unit card fails to disclose that the eastern portion of this unit also contains the highest deer Habitat Suitability Index values present in the upper Moose Creek drainage. Harvest of this portion of the unit will result in the loss of nearly all the higher value deer habitat (HSI 0.5) in the upper Moose Creek area.

Timber harvest and road construction in the Moose Creek drainage presents considerable risk to fish habitat and water quality. On page 3-100, the DEIS states: "The Moose Creek drainage contains the highest composite percentage of MMI 3(17 percent) and MMI 4(27 percent) soils/land types with approximately 44 percent of the watershed area classified as having high to extreme landslide potential." The document should have included a map depicting the location of high hazard soils along with proposed units and roads.

ADGL-13

## **Letter 5 - Alaska Division of Government Coordination (ADGC) Forest Service Response**

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### **Forest Service Response to ADGC-1**

The term storage, as used in this document, meets the definition in Attachment 1, Item H of the ACMP MOU. The terms storage and stormproofing are defined at the beginning of Chapter 2 as well as Appendix F of the Final EIS. Storage is the process of putting the road into a closed condition that protects soils, water quality, fish, and wildlife. It is the same as decommissioning except that the road remains listed on the forest road inventory because the road may be reopened in the future. The three steps of storage include:

1. Establishing drainages across the roadway that are self-maintaining and effectively prevent erosion.
2. Removing culverts and bridges and reestablishing the natural drainage patterns of streams and bypassing ditch relief culverts with waterbars.
3. Returning the roadway to resource production through natural vegetation (grass, browse, or trees).

Stormproofing is a method of maintaining a road. Drainage structures (culverts) are left in place but waterbars, rolling dips, out slopes, and other features are installed to ensure that runoff is controlled until maintenance can be performed on the primary drainage system. The road remains open.

We have tried to clarify the usage of these terms in the Final EIS.

The Forest Service has recently completed an analysis of the changes between Draft and Final as it pertains to a consistency finding with the enforceable laws of the Alaska Coastal Management Program's (ACMP) MOU. In a Project Clarification Letter (5/30/03) sent to Sandy Harbunuk (Project Review Coordinator, ADNR), the Forest Service asserted it's previous determination of consistency to the maximum extent practicable with the MOU. Specific concerns identified in the original comment letter were also addressed and clarified in our Clarification Letter.

### **Forest Service Response to ADGC-2**

Your comment that the culvert listed for the stream crossing at mile post 3.02 on road 10 is too small for the stream measurements identified is correct. This error has been corrected in the Final EIS and additional information has been provided on stream crossings. With regard to MP 2.31, the stream crossing will be moved 60 ft. upstream where only one large culvert will be required.

### **Forest Service Response to ADGC-3**

We have clarified the information on the unit card for M-123 and the road card for Road 20 (Moose Creek Road). There are a number of Class III and Class IV streams on the west side of Moose Creek, some of which exhibit active bedload transport. Culverts will be designed appropriately to handle stream flow and "over-sized" for channels that exhibit active bedload transport. The proposed road will not cross any debris avalanche paths. We do not anticipate debris flows or avalanches along the proposed road line, and although they may eventually occur, we do not design culverts to pass these extreme events. We invite the state to participate in a field review of the road line and to review survey and design documents if desired.

### **Forest Service Response to ADGC-4**

Your comment on maintaining a 300-foot no-harvest buffer on Moose Creek in Unit M-135 per AS41.17.060(7) is noted. After discussing this recommendation with ADFG biologist, Jim Cariello, we plan to look for wildlife trails along the creek during the layout of this unit. Since the harvest prescription retains 70% of the volume, we believe we can maintain forest cover along any wildlife trails discovered during layout. The unit card has been modified to reflect these changes.

The final layout of this unit has not been completed, so precise information is not available on the distance between the final unit boundary and Moose Creek (the Class I stream to the west). However, Moose Creek is a gorge-like (MC) stream in this reach, so riparian habitat does not extend far from the stream's edge like it might along a floodplain (FP) stream. The riparian buffer for this stream consists of 130 feet, measured horizontally, or the break of the channel sideslope, whichever is further. A hydrologist or fisheries

specialist will assist with final layout to ensure that Forest Plan standards and guidelines are implemented. This mitigation measure has been added to the unit card.

#### **Forest Service Response to ADGC-5**

Your recommendations regarding the unit cards are noted. Potential landings, very high hazard soils (MMI 4) soils, a 300-ft. line from anadromous fish streams, and past harvest units (with year of harvest) have been added to the unit card maps in the Final EIS. Note that final locations for landings will not be known until final layout. Known erosion control measures were noted in the unit card text in both the Draft and Final EIS.

#### **Forest Service Response to ADGC-6**

Your comments concerning road card information are noted. We have added available information on stream crossings to the road cards in the Final EIS. Additional detailed information is provided in the Proposed Stream Crossing/Stream Habitat Evaluation Forms in Appendix A of the Watershed and Fisheries Resource Report (Gagner, 1999).

#### **Forest Service Response to ADGC-7**

Comment noted. Please see response to ADGC-6.

#### **Forest Service Response to ADGC-8**

Comment noted. Please see response to ADGC-6.

#### **Forest Service Response to ADGC-9**

Your recommendation that either Alternative 3 or 4 be selected is noted.

As you indicate, the next Madan entry may not occur for 30 years; however, it is very critical that first entry timber sales develop as much infrastructure as is feasible. It is typical in Southeast Alaska, for timber values to be highest near saltwater. As road development and distance increases, the elevation generally increases. As it does, timber values usually diminish. The more roads that can be developed during the first entry, the more economical out-year projects will be.

While it is true that only 8 percent of the project area is allocated as a Timber Production LUD, the vast majority of the project area is allocated to one of three development LUDs, including Timber Production, as well as Modified Landscape, and Scenic Viewshed.

As a result of public and agency comments, a helicopter only alternative was analyzed in more depth. All units within one mile of saltwater were selected for this alternative. Ten units prescriptions of 30% Retention and six units had Clearcut prescriptions. These units provided approximately 10.4 MMBF. This alternative was then run through the current financial efficiency program, which is the NEPA Economical Analysis Tool (NEAT) for comparison with the other alternatives. The result was that this alternative had an expected bid value of -\$81.24/CCF or -\$162.48/MBF. Because this alternative was significantly more deficit than any of the other alternatives and because it was simply non-responsive to the Forest Plan standards and guidelines within the developmental LUD's beyond one mile, it was eliminated from further analysis.

#### **Forest Service Response to ADGC-10**

Your comments on travel corridors are noted and this evaluation has been expanded in the Wildlife Corridors section of the Final EIS.

#### **Forest Service Response to ADGC-11**

Your recommendation for additional surveys if the eastern portion of Unit M-123 is included in the selected alternative is noted. Unit M-123 is included in the Selected Alternatives pool of harvest units. We will be surveying for mountain goat trails during layout. Should trails be discovered, we will seek the District's Biologist recommendation for mitigation.

#### **Forest Service Response to ADGC-12**

Your recommendations regarding Unit M-123 are noted and are under consideration. A significant amount of potential mountain goat wintering habitat would be retained adjacent to and above Unit M-123. In



addition, we have increased our riparian buffers and we would create elevational corridors along the slope while meeting retention requirements. The unit card has been modified to reflect this.

Also note that the unit contains medium-value deer winter range, according to habitat capability modeling (see Figure 3-21, in the Final EIS) and it is primarily in the western portion of the unit. Unit cards for both M-123 and M-119 have been edited to note their winter range values.

#### **Forest Service Response to ADGC-13**

Your comments are noted. The location of very high hazard (MMI 4) soils has been added to the unit card maps. High hazard soils are noted on field forms located in unit files and on GIS analyses in the planning record. Also note that the majority of high and very high hazard soils in the Moose Creek drainage are located at higher elevations, above most of the harvest units and roads, especially on the east side of the drainage.

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**WRANGELL RESOURCE COUNCIL  
PO BOX 1727  
WRANGELL, AK 99929**

---

Richard Cozby, Team Leader  
USDA Forest Service  
P.O. Box 51  
Wrangell, AK 99929

Attn: Madan EIS

Dear Richard:

The following DEIS comments are submitted on behalf of Wrangell Resource Council. Wrangell Resource Council (WRC) is a local, volunteer conservation organization dedicated to protection of our natural resources. WRC is a member group of the Southeast Alaska Conservation Council (SEACC).

WRC-1

Timber sale preparation activities affecting currently roadless areas should be postponed until completion of the national roadless review. As Forest Service Chief Mike Dombeck wrote in the May/June 1999 Inner Voice, "New forest roads leave lasting marks on the land. They can increase runoff in streams and cause erosion and landslides. They can harm fish, fragment wildlife habitat, and help noxious weeds invade native ecosystems. The Forest Service has a backlog of more than \$8.5 billion in road maintenance and reconstruction needs." And he says, "It simply does not make sense to construct new roads in roadless areas when we cannot take care of the roads we have."

WRC-2

The Tongass National Forest is home to the largest collection of intact salmon streams in the world.<sup>11</sup> Bryant & Everest, Management and Condition of Watersheds in Southeast Alaska: The Persistence of Anadromous Salmon (1998). This extensive habitat produces abundant runs of wild salmon which support valuable commercial and sport fisheries. As stated in the DEIS, 80 percent of the salmon caught in Southeast Alaska originate on the Tongass National Forest. However, almost 50 years of industrial-scale logging and roadbuilding has degraded a significant amount of salmon and resident fish habitat on the forest. For example, logging and roadbuilding has already degraded over one-third of all primary fish producing watersheds on the Tongass. And while all activities associated with logging contribute to the degradation of essential fish habitat, the greatest risk has been identified as road building.<sup>22</sup> Mundy, P. R. (1998) Principles and Criteria for Sustainable Salmon Management, A Contribution to the Development of a Salmon Fishery Evaluation Framework for the State of Alaska, Lake Oswego, OR. Areas like the Madden on the Tongass must be included in the national roadless areas conservation plan to safeguard the remaining intact primary fish producing watersheds from the



harmful effects of roadbuilding.

Road building and road maintenance are a primary source of sediment, eroding soil into adjacent streams and waterways.<sup>33</sup> McDonald, LH and Smart AW (1998) Monitoring Guidelines to evaluate effects of Forestry Action on Streams in the Pacific Northwest and Alaska USEPA Region 10 p.100. Although all activities associated with logging contribute to degradation of essential fish habitat, the greatest risk has been identified as road building.<sup>44</sup> Mundy, P. R. (1998) Principles and Criteria for Sustainable Salmon Management, A Contribution to the Development of a Salmon Fishery Evaluation Framework for the State of Alaska, Lake Oswego, OR. Road building accelerates surface erosion by tearing up local stabilizing vegetation, destabilizing cover soil making it susceptible to erosion processes, and creating cut and fill situations due to steep slopes.

WRC-2  
cont

Sediment in fish streams has many harmful effects. It degrades spawning areas for salmon, reduces the pool refuge habitat for salmon, decreases oxygen levels within streams, clogs fish gills, decreases winter refuge habitat for resident fish and impedes feeding visibility.

· A 1987 study of the Kadashan watershed in Tenakee Inlet illustrated that as a result of logging road construction, sediment in settling basins showed an **increase of 20-60%** in sediment yield over a two-year period.<sup>55</sup> Paustian, SJ (1987) "Monitoring Nonpoint Source Discharge of Sediment from Timber harvesting Activities in 2 Southeast Alaska Watersheds." In: Proceedings of Alaska Section of American Water Resources Association: Water Quality in the Great Land Alaska's Challenge. p.153-168 Water Research Center, Institute of Northern Engineering, University of Alaska Fairbanks. Report IWR-109.

· A water quality study of 12 streams in western Oregon, testing water quality of one year prior and one year after logging, illustrated that road construction contributed to an **increase of 20-50%** in sedimentation. <sup>66</sup> Everest, F, Beschta, R, Scrivener, J, Koski, K, Sedell, J and Cederholm, C (1987) "Fine Sediment and Salmonid Production: A Paradox" Streamside Management: Forestry and Fishery Interactions ed. Salo, E and Cundy, T University of Washington p 108.

In its Report to Congress, Anadromous Fish Habitat Assessment, January 1995 (AFHA)<sup>77</sup> USDA Forest Service (1995) Report to Congress, Anadromous Fish Habitat Assessment Pacific Northwest Research Station Alaska Region. R10-MB-279., the USFS found that:

"Production of fine sediment from road cuts and surfaces is a significant issue in some of the watersheds that we visited (Frosty and Seagull, in particular). Especially in steeper areas, road-side ditches are routed directly to small streams from where the sediment eventually is routed to downstream fish-bearing channels."<sup>88</sup> Id., appendix 2-10.

WRC-3

Given these admissions by the head of the Forest Service, how can you justify the proposed road building, especially in areas of karst? You admit that road 2010 would impact known karst features and so will be dropped from the preferred alternative, but won't building the road still included in alternative 3 still disturb the karst in the Moose Creek drainage? While it may be true that Moose Creek is designated for intensive logging in the Forest Plan, the discovery of karst in the watershed should cause reconsideration of that designation.

On page 3-89 you say moderate vulnerability was assigned to areas with karst features (e.g. sinkholes), yet our reading of the vulnerability rating system indicated that in addition to lands over caves, karst on slopes steeper than 72%, and any watershed draining into high vulnerability karst, sinks and epikarst features greater than 8 feet in depth are defined as high vulnerability and therefore off limits to logging and road-building.

WRC-4

On 2-15 referring to the intensive harvesting planned for Moose creek the DEIS states, "Harvest in this area may also allow the flexibility to separate the large helicopter harvest in the Jenkins Cove area from a sale in the Moose Creek area that may appeal to timber purchasers with cable yarding equipment". Are these not then separate actions requiring separate Environmental Impact Statements? Given their geographical separation and different harvest techniques, these two areas probably should have separate EIS's.

WRC-5

We appreciate the fact that Tongass Cave Project was involved in cave surveys and karst inventory, and vulnerability assessments were made. We also appreciate the need to not publicize the locations of caves with sensitive remains and hazardous drops, but a little more information and maps showing how harvest and roads will impact karst in the area could give us a bit more reassurance that karst is being protected. As I am sure you are aware, during vulnerability assessment it is essential to view the karst as a system, not a collection of discrete surface features. It is also important to remember that most caves and caverns have no entrance accessible to humans, but are still sensitive to disturbance. Given that this is the first mainland karst discovered in Southeast, with significant archaeological and paleontological potential and new plant species, I hope that every effort is made to protect this precious resource.

WRC-6

Brown Bear Biologists are very concerned with the effects of timber harvest, particularly road building, on mainland bear populations. The Forest Plan requires that the Forest Service "evaluate the need for additional protection of important brown bear foraging sites" and "establish forested buffers, where available, of approximately 500 feet from the stream at sites where, based upon the evaluation, additional protective measures are needed..." Forest Plan at 4-114, WILD 112, VI, B. The Forest Plan also required that the Forest Service



"consult with the Alaska Department of Fish and Game in identifying and managing important brown bear foraging sites. The project areas substantial bear population would be significantly impacted by the proposed action, especially if the road is left open to vehicles as planned.

WRC-6  
cont

We are glad to see the Wrangell District continue to be a leader in trying alternatives to clearcutting. Group selection seems the best in terms of wildlife, visual concerns, and mimicking natural conditions. Regarding the partial retention units proposed in the sale, we would like to see some discussion of results of monitoring in other areas of the Tongass which have had similar harvest techniques: Has blowdown been a problem? Wildlife use? The genetics question raised by highgrading the healthiest and biggest trees.

WRC-7

The Forest Service should discontinue filling wetlands to build roads. You shouldn't be able to claim an exemption from getting a corps permit when there's so much evidence that forest service roads block fish passage.

WRC-8

In addition, the Clean Water Act mandates that each state's water quality standards include an antidegradation policy. See 33 U.S.C. §§ 1313(d)(4)(B), (c)(2)(A); [§§ 303(d)(4)(B), (c)(2)(A)]. The United States Supreme Court has also interpreted the Clean Water Act's mandated state water quality standards to require an antidegradation policy. See PUD v. Washington Dept of Ecology, 511 U.S. 700, 718, 128 L. Ed. 2d 716, 723, 114 S. Ct. 1900 (1994). Alaska's antidegradation policy, 18 AAC 70.015, was approved by the EPA in 1997.

WRC-9

In order to qualify for a variance from anti-degradation requirements and water quality criteria, the Forest Service must disclose sufficient evidence to support a finding that "allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located" and that "the resulting water quality will be adequate to fully protect existing uses." See 18 AAC 70.015(a)(2)(A)&(C). This submission is also essential to support the Forest Service's finding that this project is consistent to the maximum extent practicable with the Alaska Coastal Zone Management Plan. The DEIS must provide sufficient information and analysis to support these required findings.

We wonder if there is indeed market demand for this sale. In any case section 101 makes seeking to meet market demand subordinate to the agency's primary responsibility to fulfill the National Forest Management Act's multiple use, sustained yield, and resource protection requirements, and the requirements of other applicable law. The Forest Service's first obligation therefore remains to manage "all of the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people." 16 U.S.C. § 531(a) (Multiple Use-Sustained Yield Act). Only after complying with this instruction, as well as other applicable laws, should the Forest Service "seek" to meet market demand. If the combination of renewable resources that best meets the needs of the American people protects the

WRC-10




WRC-10  
cont

roadless areas on the Tongass from commercial logging and roadbuilding, as it clearly does, then Section 101 of the TTRA can not be used to exclude the Madden area from the Roadless Area Conservation rule.

We were relieved to find most activity planned for the preferred alternative in the Virginia Lake Mill Creek watershed. This popular recreational, subsistence and historical site deserves permanent protection, especially in light of the discovery of karst in the area. WRC has long advocated Wild River designation for this incredible watershed. Thanks for the opportunity to comment.

Sincerely,



Peter Branson for WRC

Cc: SEACC

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## **Letter 6 -Wrangell Resource Council (WRC)**

### **Forest Service Response**

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#### **Forest Service Response to WRC-1**

Your comment that the Forest Service should postpone a decision on the Madan Project until after the national roadless area review is completed is noted. Please refer to our response to SEACC-5.

#### **Forest Service Response to WRC-2**

Your comments on the impacts of roads on salmon and water quality are noted. The Forest Plan contains standards and guidelines and other mitigation measures, that when properly implemented, allow road construction while maintaining salmon habitat, water quality, and karst resources. Also please note that no anadromous fish streams are crossed by any potential roads and the preferred alternative includes only six resident fish stream crossings. Also please refer to our responses to USDI-14 and SEACC-6.

#### **Forest Service Response to WRC-3**

Your concerns are noted. The planned harvest and road construction in the project area are designed to protect karst and cave resources. A karst vulnerability rating was completed as outlined in Appendix I of the Forest Plan. Areas with "high" vulnerability were dropped from consideration for timber harvest and road construction. Refer to our analysis in the final EIS under the section titled Karst and Cave Resources in Chapter 3.

#### **Forest Service Response to WRC-4**

Your comment that because two sales may result from the Madan project, one helicopter sale and one cable sale, two EISs are required is noted. The purpose and need for the Madan project is to provide timber for harvest in response to the Forest Plan, while moving the Project Area towards the desired future condition for all resources. Allowing both cable and helicopter harvest operations within the Moose Creek drainage and Jenkins Cove area under this (one) Decision is necessary in order to examine a reasonable range of alternatives for satisfying the purpose and need and to compare the effects and tradeoffs of each method. A separate decision for the purpose of allowing two harvest methods within Moose Creek and Jenkins Cove, or within any other watershed in this project area would not be appropriate. In addition, the CEQ regulations for implementing NEPA state that an agency should analyze similar actions in the same EIS when it is the best way to assess adequately the combined impacts of similar actions (40 CFR 1508.25(a)(3)).

#### **Forest Service Response to WRC-5**

Your concerns regarding effects on karst and cave resources are noted. Please note that most protective measures, such as dropping entire harvest units and roads, are not displayed in the EIS in order to protect the location of the high vulnerability karst area. Indeed, we did consider the karst as a system when doing the vulnerability assessment, though individual discrete features were used as a means of assessing the unseen system. Please refer to our response to WRC-3.

#### **Forest Service Response to WRC-6**

Your comment that additional measures are needed to protect brown bear is noted. Please refer to our responses to USDI-7 and SEACC-9, which cover how the Forest Service has consulted with ADF&G, how the need for additional protection was evaluated, and other items in your comment.

#### **Forest Service Response to WRC-7**

Your comments on alternatives to clearcutting are noted. Group and individual tree selection and other methods, such as overstory removal, are just beginning to be used on the Tongass on a broader scale. Monitoring results covering a number of years are needed to assess the long-term benefits and costs of these alternatives; but these are not yet available. Refer to the discussion of silvicultural treatments in Chapter 3 of the EIS under Issue 2: Timber Management and Economics. Also, refer to Appendix G of the Forest Plan EIS (USDA Forest Service, 1997b) for a detailed discussion of the advantages and disadvantages of different silvicultural systems.



**Forest Service Response to WRC-8**

Your concern with roads blocking fish passage has been addressed in project design, in that the proposed roads do not cross any anadromous fish streams and the preferred alternative roads cross only six resident fish streams. Building and maintaining roads for timber harvest is exempt from regulation under Section 404 of the Clean Water Act provided that the roads are constructed and maintained in accordance with Best Management Practices (BMPs) listed in 33 CFR 323.4 (a) (6). Among other things, these BMPs require that fish passage be maintained and that filling wetlands be avoided whenever practicable. The Forest Service plans to seek a 404 permit. Also see our responses to comments USDI-16 and SEACC-6.

**Forest Service Response to WRC-9**

Your comment that the EIS must provide sufficient information and analysis on water quality to support a consistency finding is noted. Please refer to the discussions on Soil Resources and Watershed and Fish Resources, including the project effects discussions, in Chapter 3 of the EIS. Also, please refer to our response to SEACC-6.

**Forest Service Response to WRC-10**

We agree that the Forest Service has a responsibility to fulfill the National Forest Management Act's multiple use, sustained yield, and resource protection requirements. The Forest Plan provides guidance in accomplishing this. The objective is not to manage each acre for all the multiple uses that the forest can provide but to manage the Forest as a whole for the entire range of uses in a sustainable way. Timber production is one of the uses for which land is allocated in the Forest Plan. The Forest Plan allocates different areas to different resource outputs. It provides standards and guidelines to ensure that the Plan's objectives and applicable laws and regulations are met. The proposed Madan timber sale would implement Forest Plan direction. Portions of the project area are managed primarily for old growth (the old-growth reserves), portions to protect connectivity (such as the area within 1,000 feet of the saltwater), and portions for timber production (suitable timber lands). Other areas are managed for other outputs. In all cases, Forest Plan standards and guidelines would be implemented to ensure compliance with the Plan. Refer to Appendix A (pages A 2 and A3) for a discussion of the requirements of Section 101 of the Tongass Timber Reform Act.

Note that the 1997 Record of Decision for the Forest Plan states that 84 percent of the 1954 POG will be remaining in 2095 after full implementation of the Forest Plan.

From: Sitka Conservation Society  
Box 6533 Sitka AK 99835 907-747-7509

Richard Cozby  
Team Leader  
Attn: Madan EIS  
USDDA Forest Service  
P.O. Box 51  
Wrangell AK 99929

Dear Mr. Cozby

SCS-1      The Sitka Conservation Society supports the no action alternative for the Madan timber sale. Our primary concern is the impact on a major roadless area. We believe that the roadless areas of the Tongass have global significance as large natural ecosystems, and we believe preservation in that state serves the greatest public need. They should be preserved in a wilderness state because there are very few regions in the world of their size and intact ecosystem functions as a coastal temperate rainforest. This is not only important scientifically for resource preservation, but aesthetically and spiritually as places for humans to revisit natural systems which have not been changed and impacted by man. The Forest Service roadless draft EIS specialist report on the Tongass (Johnston, May 2000, Biological Resources Effects) provides several reasons for protecting roadless areas.

"The Tongass is unique (from other national forests ) because the majority of subsistence and game species are integrally linked to the habitat qualities provided by unroaded areas." "Because relatively little is known about the current status, needs and response to management activities for some species on the Tongass, conservative management approaches that emphasize retention of roadless areas may provide a necessary "buffer" to ensure higher likelihoods of maintaining biodiversity and species viability."

SCS-2      Employment gains resulting from logging in this area could be offset by losses in employment due to decreased recreational tourism and wildlife viewing opportunities. Timber from the Tongass National Forest does not provide a significant percentage of the nations wood supply. Timber could come from other sources on private and state lands. Individuals who submitted comments during scooping on the Madan sale stated that this area contains some of the best winter deer habitat available near Wrangell.

SCS-3      A recent report, Deconstructing the Timber Volume Paradigm in Management of the Tongass National Forest, (Caouette et al, March, 2000. Pacific NW Research Station PNW-GTR-482) discusses the limitations of vegetation datasets in managing the ecological health of the forest. One of the limitation of the volume strata database is that it does not characterize differences among forest stands in terms of forest structure. Forest structure, canopy layering and understory plant type, are important factors in determining habitat quality for wildlife. Therefore calculations of habitat suitability and remaining habitat can be flawed because they depend on these datasets.

Of the 17 million acres of the Tongass, only 1/3 contains commercially productive forest. Only 2 million acres of the Tongass contain high volume forest. And only a portion of that forest is coarse canopy old growth forest with structural characteristics which certain species are dependent upon for survival. These stands are also very valuable for timber harvest, and over time have been high-graded by man. Thus, timber sales have and have had a disproportionate impact on habitat. The roaded areas of the Tongass tend to be in valley bottoms where highly productive stands of timber were

targeted. New timber sales are scheduled into adjacent unroaded areas or as entries into locations never before targeted. We cannot afford to lose these areas. Too much valuable habitat has already been lost. It is not a question of acreage, but of quality.

The final EIS for the Madan timber sale should characterize the unit location in terms of the stand structure and site index of the locations, and compare that to available habitat in the general area.

Failing adoption of the no action alternative, we believe alternative 4 comes closest to sustainable harvest and protection of the resources we feel are most vital

We support option b for road management. We do not believe the Forest Service will be able to maintain adequate funding for road maintenance and therefore should not build new roads nor promise to keep them open. Recent studies of fish passages in roads across the Tongass show the damage caused by improperly designed or maintained roads.

SCS-3  
(Cont)

Sincerely,

Page Else, GIS Analyst

Sitka Conservation Society



## **Letter 7 - Sitka Conservation Society (SCS)**

### **Forest Service Response**

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#### **Forest Service Response to SCS-1**

Your comment that roads should not be built in areas otherwise unroaded is noted. Please refer to the new section in the Final EIS on the Madan Inventoried Roadless Area. Also note that the Forest Plan EIS (1997) evaluated alternative allocations for all roadless areas on the Tongass and the Record of Decision assigned LUDs after reviewing public input. Much of the Madan roadless area was assigned to non-development LUDs, but the majority was assigned to development LUDs. The Madan project is simply implementing these Forest Plan-level decisions. Also refer to response to SEACC-5.

#### **Forest Service Response to SCS-2**

Your comment that employment gains resulting from logging could be offset by losses in recreation and tourism employment is noted. Please refer to the discussion on employment under Issue 2: Timber Management and Economics in Chapter 3 of the Final EIS. We do not agree that the sale would decrease the number of jobs in recreation, tourism, fisheries, and alternative forest products. If left open, the roads may actually create new opportunities for recreation and tourism in the project area by improving access in areas that are very lightly used at present.

#### **Forest Service Response to SCS-3**

Your comment that there is high-value deer habitat within the project area that should not be lost and that the Final EIS should characterize each unit in terms of stand structure and site index and then compare these areas to the general area is noted. High, medium, and low deer habitat are displayed in Figure 3-21 and discussed in Chapter 3 (Issue #3 of the Final EIS). Unit boundaries are also shown in Figure 3-21 in the Final EIS. Note that most harvest units are not in high value deer habitat. See also responses to USDI-2, USDI-5, and USDI-10.

The Forest Service is currently verifying the accuracy of models for use in identifying coarse canopy stands. Until that assessment is complete, timber volume (TIMTYP) classes 6 and 7 are believed to be an adequate predictor of those stands (Caouette et al., 2000). Characteristics of these stands include relatively low stem densities, large diameters, and a canopy that appears coarse-textured when viewed from the air. There are currently a total of 1,716 acres of volume class 6 and 7 within the Project Area. Timber harvest is permitted in 839 of those acres of volume class 6 and 7.

We also note your comments in favor of Alternatives 1 and 4 and Option B for road management strategy.

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Richard Cozby  
Team Leader  
Atten: Madan EIS  
USDA Forest Service  
P.O. Box 51  
Wrangell, AK 99929

Following are comments on the Madan Draft EIS. These comments are premised on the situation brought about by the extreme withdrawals and forest wide management constraints placed on the forest managers by the current administration. These restraints have resulted in the need to think in terms of maximizing yields, economics and quality of the timber coming off of the few remaining acres where timber harvest can occur. It is not possible to apply all the constraints to every acre and produce a viable timber supply. The comments are related to Alternative 2.

- GW-1** Minimize partial cuts until the silvicultural success of the ATC sales has been proven. There is evidence available to show that partial cuts of the past (fish traps and aircraft wood logging) have left unproductive stands. It is critical to use silvicultural methods that maximize second growth volume and quality. The withdrawals (single use wilderness and OGR) have reduced the productivity of the forest to unacceptable levels.
- GW-2** Reduce the OGR around Virginia Lake to a beach fringe as done on the Eastern Passage. The OGR on the East Side of Madan Bay should also be reduced to a beach fringe. These two changes will still allow for corridors but will also permit increasing the volume available to the Jenkins Cove Log Dump.
- GW-3** Units J 31,32,33 and 36 can be changed to improve the over all economy of the sale by reducing helicopter logging and constructing more road so that there can be more cable logging. The attached chart quantifies the changes.
- GW-4** In order to maintain a viable timber sale program entries must be more frequent than 40-60 years. Recognizing growth experience on Prince of Wales Is, it is apparent that second entry can occur within 35-40 years with third entry within 10-15 years. At 35 to 40 years commercial thinning can begin in conjunction with continued old growth removal. The roads constructed in the initial entry will give the flexibility to manage in this manner. The drastic reductions made in the Lyons ROD makes it imperative to look to more innovative methods to compensate for the extreme reductions in timber supply.
- GW-5** As shown on attachment adding road and changing some of the helicopter logging to cable will result in adding \$400,000 of value to the sale. In addition on the second entry in 35-40 years access will be available for subsequent management and harvest entries. These added roads are an investment that will continue to payoff in years to come.

Thank you for the opportunity to comment.

George Woodbury  
Box 1934  
Wrangell, AK 99929



<u>Sale</u> <u>Madan</u>						
unit	Helicopter		Increased Harvest	Cable		Cable Road @ \$150,000 per mile
	25% cut MBF	\$/MBF \$300		\$/MBF \$75		
J-31	235	\$17,625	500	\$37,500	cable	
J-32	1850	\$555,000	3000	\$225,000	cable	1.52
				\$0	heli	
J-33	890	\$267,000	2000	\$150,000	cable	0.38
J-36	400	\$120,000	1500	\$112,500	cable	0.28
					tot road	2.18
	3375	\$959,625	7000	\$525,000		
Difference				\$434,625	savings	\$326,705 cost      \$107,920 net savings

unit	Helicopter		Proposed	Cable		Cable Road @ \$150,000 per mile
	25% cut MBF	\$/MBF \$300		\$/MBF \$75		
M-156	811	\$243,300	1500	\$112,500		0.95
M-161	404	\$121,200	1300	\$97,500		
		\$0		\$0		
		\$0		\$0		
					tot road	0.95
	1215	\$364,500	2800	\$210,000		
Difference				\$154,500	savings	\$142,045 cost      \$12,455 net savings

<u>Savings Resulting from added Volume</u>					
Tot MBF	4590		9800		
Add. MBF			5210		
Fixed cost	MBF	per MBF	amt	reduction amort.	savings \$MBF
	32169	\$109	\$3,506,421	\$94	\$15

Tot Fixed		
\$3,975,171	\$106	\$99,140
Total Savings		\$219,515

## **Letter 8 - George Woodbury (GW)**

### **Forest Service Response**

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#### **Forest Service Response to GW-1**

Your comments that partial cuts should be minimized until they are proven to be effective and that withdrawing areas from timber production has reduced the productivity of the forest to unacceptable levels are noted. Single tree and group selection mimic gap-phase windthrow, a process that has shaped forests in the project area for generations. While clearcutting may be more productive for some resources, such as growing Sitka spruce, it can be less productive for other resources, such as for wildlife species that depend on complex, multi-storied stand structures and snags. Allocation of some areas for non-timber uses, such as the old-growth reserves, is required by the Forest Plan. We do not agree that these areas are no longer productive.

Under the current Tongass Land Management Plan we no longer have the flexibility to use the clearcutting prescription as we had under previous Forest Plan direction. Where we have provided for partial cutting, we have done so to meet direction to protect scenic and other resource values associated with the project area. Traditional clearcutting, with reserves, is provided within this project wherever this prescription is compatible with current Forest Plan direction. Also note in the ROD, that several partial cut harvest units within the Virginia Lake view shed were eliminated until we can more thoroughly examine the success of this prescription in the Jenkins Cove area.

#### **Forest Service Response to GW-2**

Your comment that the old-growth reserve in the Virginia Lake area should be reduced to the beach fringe is noted. However, these reductions would not comply with the Forest Plan.

#### **Forest Service Response to GW-3**

Your comment that Units J-31, 32, 33, and 36 should be cable-logged to improve economics is noted. The preferred alternative has chosen to cable log Unit J-31.

#### **Forest Service Response to GW-4**

Your comment that entries of 35 to 40 years should be provided with a third entry 10 to 15 years later is noted.

#### **Forest Service Response to GW-5**

Your comments on how to add \$400,000 to the value of the sale by adding roads and changing four units from helicopter to cable logging are noted. Roads were not planned for these units due to a combination of cost factors and resource concerns.

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David Crown  
9386 Landings Square  
#507  
Des Plaines, IL. 60016-5270  
26 June, 2000

Carol J. Jorgenson  
Assistant Forest Supervisor  
USDA Forest Service  
Tongass National Forest  
P.O. 309  
Petersburg, AK 99833

Dear Ms Jorgenson:

I am a recipient of the EIS on the Madan timber Sale in the Tongass National Forest. In reading through the Report, I noticed that the Preparer's Section (Section 7) contains a serious conflict of interest. Of the 16 Preparers, 8 people are, or were, employees of the Foster Wheeler Environmental Corporation, (the Corporation) and the Corporation, too, is listed as a Preparer. This gives the Corporation a 56% majority of the Preparers. Should any other Preparer dissent, he would be overwhelmed by the Corporation, as the dissenter would be in the minority.

DC-1

I know that, many times, corporations are sought out for their expertise, but in this instance, with the Corporation having a vested interest in timber harvesting, I think such a majority is improper. In essence, the Corporation could overrule YOU, the USDA, the FDA, the EPA, the citizens of Alaska in the Tongass area, and anyone else who disagrees with their policies on timber "harvesting". Furthermore, to have the interested parties as contributors to an Environmental Impact Statement is, as I have stated, a clear case of a conflict of interest. Who will see to it that the Corporation adheres to the law? Isn't this kind of like letting the wolves watch the sheep? Do you honestly think that the Corporation is going to put anything in an EIS that would limit their powers? Who is there to monitor the Corporation's clearcutting, which everyone, including YOU, knows they are going to do?

I strongly believe that this EIS is faulty, and a new panel of Preparers should be appointed. In addition, I believe that an investigation should be initiated by Congress to void this EIS, and remove some of the Corporation's preparers. A new EIS should be prepared, without such an obvious slant in favor of the timber interests. The people are being short-changed about timber sales as it is.

Sincerely,



David Crown

CC: Senator Dick Durbin  
Senator Inouye  
Representative Henry Hyde

Received

JUL 11 2000

Tongass N.F.

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## **Letter 9 – David Crown (DC)**

### **Forest Service Response**

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#### **Forest Service Response to DC-1**

Your comment that the EIS should be voided because the majority of the preparers are private contractors is noted. The government often hires private contractors to work on government projects. It is not correct that the private contractor can over-rule the Forest Service or other government agencies. The Forest Service and the Madan Interdisciplinary Team (IDT) closely direct the proposed action, the alternatives, and the analysis. The IDT is made up of a multitude of resource specialists. Only the Forest Service makes the decision, after considering the analysis and input from the public and from other government agencies. It is also not true that Foster Wheeler Environmental Corporation has a vested interest in timber harvesting. Foster Wheeler Environmental is an environmental consulting firm specializing in EISs involving natural resource projects, has prepared numerous EISs and EAs for the Forest Service in Alaska and the Pacific Northwest, and is not involved in timber harvesting.



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August 3, 2000

Dear Mr. Corby, Team Leader

LM-1 After reading all the Alternatives in the Madan  
Timber Sale Draft EIS, the only good alternative  
is Alternative 1: No Action. There is way too much  
logging and road building in the Tongass National  
Forest. Roadless areas should remain roadless and  
unlogged, and all trees over the age of 99 yrs. should  
be left alone to live out their natural lives, not  
become victims to the Alaska chainsaw massacre!  
LM-2 Our trees are more valuable left alive and standing  
tall than ground up for junk mail, or made into flammable  
earthquake claspings, ugly strip houses!  
I also think that Assistant Forest Supervisor,  
Carol J. Jorgensen, is a whore to the timber  
industry in Alaska, or he is a coward and refuses  
to stand up to Alaska's politicians. That's why he  
wants more logging and less forest preservation.  
I say lets have more forest preservation by getting rid  
of (fire or resign) forest supervisors like Carol J.  
Jorgensen.

Thanks

Lori Morgan

LORI MORGAN

1951 HARTNELL AVE APT 3  
REDDING, CA 96002

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**Letter 10 - Lori Morgan (LM)**  
**Forest Service Response**

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**Forest Service Response to LM-1**

Your comment that roads should not be built in roadless areas is noted.

**Forest Service Response to LM-2**

Your comment that all trees older than 99 years should be retained is noted.

**Forest Service Response to LM-3**

Your comment that there should be no more commercial logging is noted.

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LAnnD4animals@aol.  
com

To: rcozby@fs.fed.us  
cc:  
Subject: Maden Timber Sale DEIS

08/11/2000 01:07 PM

JLD-1

We are among the millions of the TRUE LANDOWNERS of our national forests who are VERY angry that our forests are being sold out (DESTROYED) for the sole benefit of timber corporations, OUR Forest Service, and a few local workers. Please keep in mind that our forests belong to ALL Americans, not the few who benefit from them financially--at taxpayer EXPENSE.

It doesn't matter if they're called Polk Small Sales and Salvages, Maden Timber Sales, Deer Run Salvage,

Shady Timber Sale, Woodpecker Project Area, etc., etc., etc.; it doesn't matter if the logging occurs in hidden places so as to have "natural-appearing landscapes", "maintain scenic quality in areas viewed from popular land and marine travel routes" while permitting timber harvest"; it doesn't matter if the logging is done all at once or piecemeal --25,000 acres here, 4800 acres there, 2100 acres here, 2.6million board feet of timber there...the RESULTS are the same---a fractured ecosystem.

We, the many millions of Americans, who are the true owners of this land want OUR FORESTS to remain wildlands full of the wildlife we want to enjoy ALIVE!

We now know how our forests have been destroyed AT OUR EXPENSE; we also don't buy the argument that we must destroy our forests for a few local jobs. We now know, and YOU know that an intact forest has MANY times more economic (and certainly many times more environmental) value than a logged one! We also don't buy the excuse that you're just following the Tongass Forest Plan; we know this, too, was concocted by those timber corporations our Forest Service, and the legislators who receive ample campaign contributions for selling out our forests. You don't HAVE to destroy the forests!

We know this is not the response you want from us, but we are just reflecting what millions of angry Americans are saying: ENOUGH IS ENOUGH! NO MORE COMMERCIAL LOGGING ON OUR FORESTS! WE MUST SAVE WHAT'S LEFT FOR OURSELVES AND FUTURE GENERATIONS!

If you don't have the courage to initiate such a policy we will do it for you at the ballot box by

electing conservation-minded leaders who will fill

our Forest Service with people who care more about saving our forests than profiting from their destruction!

Thank you for the opportunity to respond to this vitally important issue!

Mr. and Mrs. J.L. Denison  
6931 E. 11th St.  
Long Beach, CA 90815



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**Letter 11 - J. L. Denison (JLD)**  
**Forest Service Response**

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**Forest Service Response to JLD-1**

Your comment that cutting areas that are out of sight still result in a fractured ecosystem is noted.

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FOREST CONSERVATION COUNCIL

Richard Cozby, District Ranger  
Wrangell Ranger District  
Tongass National Forest  
P.O. Box 51  
Wrangell, AK 99929

Tuesday, August 15, 2000

RE: Comments on the Madan Timber Sale Draft EIS

Dear Mr. Cozby,

Forest Conservation Council and the National Forest Protection Alliance are tax-exempt, public interest organizations with individual and business members throughout the United States.

FC C-1

We are concerned with the adverse economic effects of the national forest logging program, and the Forest Service's failure to quantify such effects at the project level or for the program as a whole. The logging program increases costs of water purification and filtration, decreases the value of private timberlands, unfairly competes against alternative fiber and building material businesses, increases wildfire risk, increases repair and maintenance costs for highways and public roads, and decreases the number of jobs in recreation, tourism, fisheries, and alternative forest products.

FC C-2

The Madan Timber Sale will jeopardize the viability of species that thrive in naturally disturbed forests, intervene in natural disturbance processes that are vital to ecosystem sustainability, and degrade water quality and watershed condition. The analysis on which the Forest has relied is inadequate, flawed and biased in a number of ways, rendering any potential decision arbitrary and capricious.

Our concerns with the Madan Timber Sale include:

1. Socioeconomic Benefits

USFS timber sales are the end result of inter-related planning decisions and analyses made at the national, forest, and project level. 36 C.F.R. § 219.4. At the national level, the Forest Service prepares the Renewable Resources Program (RPA), which determines output levels for all national forest resources based upon a comprehensive environmental and economic assessment of present and anticipated demands for and supply of renewable resources from forests in all ownership. At the forest level, the Forest Service

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P.O. Box 22488  
Santa Fe, New Mexico 87502  
(505) 986-1163

Southeastern Regional Office  
P.O. Box 276268  
Boca Raton, Florida 33427  
(561) 347-0949

Mid-Atlantic Regional Office  
3526 Firey Run Road  
Linden, Virginia 22642  
(540) 364-9651

has prepared the Tongass National Forest Land and Resource Management Plan ("LRMP"), which is an "extension" of the RPA Program and which identifies lands that are suitable for timber sales, the amount of timber to be offered each year, and under what conditions timber sales will be offered. At the project level, the Forest Service makes decisions about the specific configuration of individual timber sales, including the Madan Timber Sale. At each level, the Forest Service must engage in environmental and economic analyses of its decisions as required by the National Environmental Policy Act.

The Forest Service is required by law to manage national forest system lands and programs to maximize social and economic benefits for the American people. As with other projects planned on the National Forests of Alaska and throughout Region 10, the Forest Service has failed to complete an economic analysis of the Madan Timber Sale that provides the public with a full and fair accounting of net economic benefits. Instead, the economic analysis is limited to net costs incurred by the Forest Service and project administrators for county receipts as well as sale preparation and administration costs.

The draft EIS and project record fail to place any economic value on existing uses and functions of the sale area, including recreation, flood control, pest control, carbon sequestering, and many other "ecosystem services." In addition, the economic analysis fails to consider a wide range of costs that will be incurred by the public through loss of these "ecosystem services" and other externalized costs such as increased flooding, increased risk of death, injury, and property damage from logging operations.

Forest Conservation Council has raised these economic issues in the context of numerous appeals in Region 10. We incorporate, by reference, these appeals for a more complete description of our issues on this subject.

## 2. Value of Unlogged Forest

The dollar value of undisturbed forest or standing timber should have been calculated and used in the analysis of economic costs associated with the Madan Timber Sale. The value of "ecosystem services" provided by standing forests has never been evaluated and compared with their value as lumber. Economic benefits of standing forests include but are not limited to clean air and water, balance of global geochemical cycles, and buffering of carbon emissions resulting from the burning of fossil fuels. It has been shown that the rate of carbon lost to that of accumulation is much greater during harvest, and there is a net transfer of carbon from biomass to atmospheric CO<sub>2</sub>. Further, the carbon stored in forest regrowth is less than that in the original forest biomass.

FCC-3

FCC-4

FCC/NFPA 45-Day Comments,  
Madan Timber Sale, p. 2 of 4

### 3. Species Viability

The Madan Timber Sale includes commercial harvest, ground-disturbing activities associated with timber harvest and other vegetative manipulation. These activities are likely to jeopardize the viability of species that find optimal habitat in forests with well-developed structures, and forests naturally disturbed by fire, disease and insect pathogens. These include threatened, endangered, and sensitive species, as well as management indicator species.

FCC-5

For many of these species the Forest Service has no up-to-date population data describing population numbers, locations, and trends, nor monitoring data on which the agency can rely to determine that the actions proposed in the context of the Madan Timber Sale will maintain numbers and distribution of these species sufficient for insuring long term viability. Because the Forest Service has no such data for most species adversely affected by the proposed management activities, and because what data there is suggests that such species are declining and otherwise at risk, the Forest Service runs afoul of viability and diversity requirements set forth in forest planning regulations 36 C.F.R. § 219.19 and § 219.26.

### 4. Cumulative Effects

The USDA Office of Inspector General has identified cumulative effects analysis as an area of concern for the Forest Service in particular and this is a significant issue. (USDA Office of Inspector General Evaluation Report. 1999. No. 08801-10-At)

The Forest Service Environmental Policy and Procedures Handbook sets the standard for analysis of cumulative effects:

FCC-6

"Individual actions when considered alone may not have a significant impact on the quality of the human environment. Groups of actions, when added together, may have collective or cumulative impacts which are significant. Cumulative effects which occur must be considered and analyzed without regard to land ownership boundaries. Consideration must be given to the incremental effects of past, present, and reasonably foreseeable related future actions of the Forest Service, as well as those of other agencies and individuals."

Despite this clear direction, the Madan Timber Sale draft EIS avoids the required analysis and ignores important contributors to cumulative effects. Cumulative impacts are analyzed in context only of timber harvest, no attention is provided to other factors such as increased passenger vehicle and OHV use.



Please address these issues in your final environmental impact statement. Thank you for your time and consideration.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Bryan Bird', with a large, stylized flourish extending to the right.

Bryan Bird  
Forest Conservation Council  
Southeastern Regional Office

FCC/NFPA 45-Day Comments,  
Madan Timber Sale, p. 4 of 4

## **Letter 12 - Forest Conservation Council (FCC)**

### **Forest Service Response**

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#### **Forest Service Response to FCC-1**

Your general comments on the effects of the national forest logging program are noted. We believe that the effects have been adequately identified both at the project and at the Forest plan level. Also please refer to our response to SCS-2.

#### **Forest Service Response to FCC-2**

Your general comments on species viability, water quality and other issues are noted. We do not agree that the viability of species that thrive in natural forests would be jeopardized by this sale. The Forest Plan implemented a comprehensive conservation strategy to ensure the long-term viability of species. This strategy was based on a full analysis and disclosure of the effects of alternatives and was presented in the Forest Plan EIS (USDA Forest Service, 1997b). The Madan project has been reviewed by ADF&G, USFWS, and NMFS. None of these agencies suggested that the project would jeopardize the viability of any species. Wildlife habitat issues, including threatened and endangered animal and plant species, are discussed in Chapter 3, Issue 3 of the Final EIS. However, population viability is more appropriate as a Forest Plan level analysis, not a project level analysis.

#### **Forest Service Response to FCC-3**

Your comments on the social and economic analysis in the EIS are noted. Please refer to our response to SEACC-14, which describes the Forest Service planning process. Also see our response to the following comment, FCC-4.

#### **Forest Service Response to FCC-4**

Your comment that the dollar value of undisturbed forest or standing timber, including clean air and water, balancing the global geochemical cycle, and buffering carbon emissions from burning fossil fuels should be calculated and used in the economic analysis is noted. Standards and guidelines in the Forest Plan protect air and water; therefore, there would be little, if any, value change for these resources from this project. Balancing the global geochemical cycle is beyond the scope of a project-level analysis. We do not agree that it has been shown that there is a net loss of carbon over the length of a rotation from forest management in Southeast Alaska. Carbon, in the form of lumber, is stored in the buildings that it is used to construct and carbon is removed from the atmosphere and stored in the new trees that grow in the openings created by harvest. Since there are no plans to burn the slash remaining after harvest, carbon stored in this material will continue to be stored until it decomposes, as it would in an unmanaged stand. Some authors argue that there would be a net increase in stored carbon, but we know of no research in Southeast Alaska that would prove or disprove this point. In any event, this is a Forest Plan issue, not a project-specific one. Also, please refer to our response to SEACC-14.

#### **Forest Service Response to FCC-5**

We do not agree that this project would jeopardize the viability of species that find optimal habitat in forests with well-defined structures and forests naturally disturbed by fires and pathogens. The Forest Plan has implemented a comprehensive conservation strategy to assure long-term viability of species (TLMP 1997). This project implements that strategy (see Chapter 3, Issue #3 of the Final EIS). The project was reviewed by ADF&G, USFWS, and NMFS. None of these agencies have suggested that the project would jeopardize the viability of any species. No threatened or endangered species would be adversely affected. Population viability is appropriate as a Forest Plan level analysis, not a project level analysis. Also refer to our response to FCC-2.

#### **Forest Service Response to FCC-6**

The effects of potential increases in access resulting from road construction and harvest in the project area are addressed in a number of places in the EIS. For example under the Issue 3: Wildlife Habitats and Species of Concern section of Chapter 3, the effects of increased access are specifically addressed under those species that might be affected, including Sitka black-tailed deer, mountain goat, wolf, black bear, brown bear, marten and other species. Cumulative effects are also addressed in a separate subsection. Likewise the effects of increased access on recreation are addressed extensively throughout the effects

portions of the Issue 1: Scenic Quality and Recreation section of Chapter 3. Cumulative effects are also addressed separately in this section.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, WA 98101

Reply To  
Attn Of: ECO-088

AUG 22 2000

Richard Cozby  
Attn: Madan Timber Sale, USDA Forest Service  
P.O. Box 51  
Wrangell, AK 99929

Dear Mr. Cozby:

We have reviewed the draft Environmental Impact Statement (EIS) for the proposed **Madan Timber Sale** in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and §309 of the Clean Air Act. The purpose and need for the project is to

- provide timber, associated jobs, and other economic benefits;
- manage the project area for future timber production; and
- ensure that sufficient scenic values and old growth forest habitat remain.

The draft EIS identified Alternative 3 as the preferred alternative.

Based on our review, we have rated the draft EIS, EC-2 (environmental concerns, insufficient information). This rating and a summary of our comments will be published in the Federal Register. A summary of the rating system we used in our evaluation of the draft EIS is enclosed for your reference.

Our attached detailed comments focus on potential impacts from proposed roads and Log Transfer Facilities (LTFs). We understand the potential impacts to wildlife, wildlife habitat, water quality, hydraulic connectivity, among others that this project will introduce by building roads in the undeveloped project area. We believe that there are a number of measures that should be taken and described in the EIS to minimize impacts from roads. Mainly, action alternative(s) that minimize road construction should be adopted and impacts from roads should be curtailed as soon as possible following harvest. This is most effectively done by decommissioning roads. It also appears that roads can be realigned on road cards to minimize impacts to wetlands. Finally, we request additional information on stream crossings, road maintenance (especially the terms decommissioning, road storage, and stormproofing), and the economic rationale for keeping roads open (when a lack of maintenance funds currently exists).

Our concern about Log Transfer Facilities (LTF) is based on the history of contamination from petroleum spills at other sites and the potential impacts to anadromous fish at Moose Creek from the LTF proposed there. We recommend that hardened surfaces be placed at permanent LTF sites to help capture fuel lost during a spill and that the Forest Service consult with the National Marine Fisheries Service (NMFS) to ensure that LTFs would not endanger salmon and other fish stocks managed by NMFS (and covered under the Essential Fish Habitat Provisions of

2

the Magnuson Stevens Act).

Please contact Chris Gebhardt of my staff at (206) 553-0253 if you have any questions about our comments. Thank you for the opportunity to review this draft EIS.

Sincerely,



Richard B. Parkin, Manager  
Geographic Implementation Unit

enclosure

cc: Kevin Hanley, DEC  
James Barthelme, USFS

FOREST SERVICE

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**EPA's Detailed Comments on the Madan Timber Sale  
Draft Environmental Impact Statement (EIS)**

**Roads**

Lack of funding to maintain system-wide roads on National Forest lands

EPA-1

We recommend that the EIS reconcile proposals found in the EIS to build significant miles of road when the Forest Service is currently limited by inadequate funding to maintain existing roads and Forest Service proposals exist at the national level that redirect Agency's road policy away from building and maintaining transportation infrastructure to support logging. Alternatives 2, 3, 4, and 5 propose to construct 15.0, 7.4, 4.6, and 10.3 miles, respectively, in a roadless area.

The Forest Service web site states that a \$8.4 billion maintenance and reconstruction backlog exists and that the Forest Service receives only about 20 percent of the annual funding needed to maintain the existing road system to current environmental and safety standards. If this reflects the condition of the road system and the road maintenance budget on the Tongass, the 5-15 miles of road proposed here would likely contribute to water quality impairment of the local stream system and exacerbate the Forest Service maintenance problems nationwide. We therefore recommend that the EIS 1) explain how these additional roads would be maintained, 2) require their obliteration, or 3) develop a proposal without significant road building.

Storing Versus Decommissioning Roads

EPA-2

We recommend that the decisionmaker adopt Option B for access management and ensure effective closure of roads by decommissioning roads in lieu of doing so by the proposed methods of using barrier berms or storing the road. All action alternatives propose building roads in a roadless area and thus introducing impacts associated with roads to wildlife, wildlife habitat, water quality, hydraulic connectivity, among others. We believe that Option B would minimize impacts to these resources and that decommissioning closed roads versus installing barrier berms or storing the road is necessary to limit the risk that improper maintenance (due to inadequate funding) would exacerbate impacts to resources. Adding roads to the existing road system that require monitoring and maintenance would stretch maintenance funds to an even thinner margin.

We are confused by the statement that "economic analysis contained in the Draft EIS indicates that the cost for road maintenance over a 30-year period under Option B would be similar to the costs of closing the roads at the termination of the sale under Option B" since Option B is by definition the one that calls for closing roads. We assume that the EIS should read that the cost of road maintenance over a 30-year period under Option A would be similar to the costs of closing the roads at the termination of the sale under Option B. We favor decommissioning roads following harvest despite the similarities in cost between closing them



following harvest and maintaining them for 30 years because 1) decommissioning roads would curtail impacts to resources right away, 2) there are no guarantees that funds to maintain the roads would exist in future years (whereas a commitment to decommission the roads could be included in the ROD), and 3) it is uncertain whether Forest direction would call for harvesting in the project area in 30 years.

EPA-2  
cont

Moreover, we believe that maintaining project roads in storage is unnecessary given that the EIS does not schedule future harvest for another 30 years. This along with the explicit recognition on page 1-13 that "roads proposed for the project will allow more and greater opportunities for hunting, camping, and other forms of recreation" indicate that the intent of keeping the roads open under Option A is outside the silvicultural exemption listed under Section 404(f)(1) of the Clean Water Act.

We recommend that the EIS define the terms decommissioning, road storage, and stormproofing in greater detail to allow readers to better distinguish between the terms. The terms are inconsistently used in the EIS or appear to have different meanings from their common usage. For example, the EIS defines decommissioning as having the same minimum requirements as storage, except that the road is removed from the forest road transportation inventory. Conversations with Forest Service staff indicate that decommissioning is usually seen as distinct from storage in that decommissioning restores the former road to a condition not requiring maintenance by doing such things as outslowing (in lieu of keeping ditches with stored roads). In addition, the terms stormproofing and road storage are used as both synonymous in some sections of the EIS (e.g., S-4), yet are presented as distinct in others (e.g., 2-2). These terms should be clarified and their usage in the EIS should reflect distinct meanings.

EPA-3

#### Minimizing Impacts to Wetlands

Our examination of the road cards in the DEIS revealed several road segments that could be relocated to minimize impacts to wetlands. This led us to agree with the statement made by Ralph W. Thompson, field office manager with the Corps of Engineers in his letter dated July 6, 2000:

The DEIS addresses wetland avoidance and minimization measures on page 3-133 with regard to compliance with Executive Order 11990, stating that wetland impacts would be minimized by avoiding overburden disposal in wetlands and avoiding road construction through wetlands whenever practicable. The road location cards reflect several additional opportunities to avoid or minimize impacts to wetlands.

EPA-4

We believe that there are multiple site-specific opportunities to relocate road alignment in order to reduce wetland crossings, in addition to the three noted by Mr. Thompson in his letter. For example, it appears that realigning road number 10 could reduce the miles of wetland that are crossed on page C-4. The road segment running the length of the wetland located in the lower left corner of the page could be moved right to run between the right edge of the wetland area and the

proposed harvest units. We recommend that road cards in the EIS arrange road segments to optimally reduce impacts to wetlands pursuant to Executive Order 11990.

EPA-4  
cont

#### Additional Information on Stream Crossings

We recommend that the EIS include additional site-specific information about stream crossings (e.g., bankful width and depth, channel type, and incision depth) similar to that found on C-8 of the Skipping Cow FEIS.

#### Log Transfer Facilities (LTFs)

EPA-5

We recommend that the EIS should include the economic analysis that led to the elimination of the LTF-Barge Only alternative. EPA believes that keeping logs out of the salt-water (through the use of bulkhead LTFs and barges among others) is the only way to effectively eliminate the disruption of biota during log transfer and storage, the leaching of soluble materials that may be toxic, and the loss of bark and resultant effects on the benthos. Logs that have been kept out of the salt water are more valuable to mill operators because their bark and outside layers can still be utilized for hog fuel and wood products. Examining the feasibility of barging logs is an element of the Alaska Timber Task Force Log Transfer Facility Guidelines (see page D-7) that should be further explored in the EIS. We therefore recommend that the EIS present information which demonstrates that the LTF-barge only alternative considered was eliminated because of its economic infeasibility. The economic analysis should factor in the cost of maintaining the shot rock ramps at Moose Creek and Jenkin's Cove.

EPA-6

We recommend that the EIS propose placing hardened impervious surfaces under all permanent LTFs to allow users to capture petroleum products in the case of a spill. Experience has shown that the interstices between shot rock (which is the proposed building material for the LTFs) can serve as an efficient pathway for spilled petroleum products to travel to and contaminate groundwater and the marine environment. We recommend that the EIS take steps beyond developing plans to prevent and deal with petroleum spills by developing a hardened surface at LTF sites. We believe that the Forest Service should build pollution prevention infrastructure such as a hardened surfaces because it cannot ensure that future users of proposed LTFs (i.e., private parties other than the Forest Service and its contractors) will follow practices that will prevent or effectively deal with petroleum spills.

EPA-7

We recommend that the Forest Service consult with the National Marine Fisheries Service (NMFS) about potential impacts of LTFs to Essential Fish Habitat (EFH) of marine species included in a Fishing Management Unit (see 50 CFR 600.905). We believe that language found on page 3-105 and 106 does not provide assurances that the Essential Fish Habitat Provisions of the Magnuson-Stevens Act are being followed, especially since 50 CFR 600.815, 7, ii) prohibits the "disposal or spillage of any material (dredge material, sludge industrial waste or other potentially harmful materials) which would destroy or degrade EFH. Our concerns are largely based on the close proximity of the mouth of Moose Creek (an anadromous stream) to a



proposed LTF site (over 500 feet). The existing regulatory framework allows for up to one acre of continuous coverage of bark that is up to 10 cm deep. This indicates to us that impacts could potentially occur to fish migrating through the mouth of Moose Creek even if the LTF is in compliance with all applicable permits. Thus, we recommend that the Forest Service consult with the NMFS to ensure that proposed LTFs would be consistent with EFH Provisions..

EPA-7  
Cont.

For your information, EPA issued two National Pollutant Discharge Elimination System (NPDES) general permits for Alaskan log transfer facilities (LTFs) that became effective March 21, 2000. The permits authorize the discharge of bark and wood debris, as well as the incidental discharge of petroleum products and sediment, into both near-shore and offshore marine waters in Alaska. Permitted facilities are required to develop and implement pollution prevention plans and to restrict their discharges to inside the perimeter of their delineated "project area." Additional controls will be required if annual monitoring shows that one acre of continuous coverage and deposits 10 cm or greater at any point are exceeded.

We issued two different permits to acknowledge the differences between facilities permitted prior to October 22, 1985 and those operating with permits issued after that date. The LTFs with permits issued prior to October 22, 1985 are automatically covered on March 21, 2000 under the pre-1985 general permit and shall operate under the conditions of the old permit as well as the new general permit. These facilities must notify the EPA that they are still in operation.

LTFs not possessing a permit prior to October 22, 1985 will be authorized to discharge under the post-1985 general permit only after they file a Notice Of Intent for coverage with the EPA and the Alaska Department of Environmental Conservation (ADEC), and/or they receive a notification of permit coverage from the EPA. The EPA has the option to automatically cover these facilities without receiving the Notice of Intent application.

#### Other Concerns

Page S-5 and others describe harvest prescriptions with different percentages of retention. What is the basis of these percentages? Are these prescriptions supposed to mimic natural windthrown disturbances? How are you selecting which trees to be harvested or retained? Is it based on geographic distribution or the value of the tree?

EPA-8

Page 3-21 states that the Virginia Lake Cabin is popular with hunters during the fall moose hunting season, yet sections on recreation, wildlife, and subsistence do not describe impacts of the project on moose and their habitat. We recommend that the EIS include information discussing impacts of the project on moose and their habitat.

EPA-9

Pages 3-35 and 3-36 describe different silvicultural treatments. We recommend that the EIS describe the potential to regenerate the stand. How long will it take the stand to reach maturity? Are the dimensions (i.e., height and basal diameter) of trees in a second growth stand similar to

EPA-10



- EPA-10  
cont | those in an old growth one? Are old growth and second growth trees similar have different rates of survival due to disease, insects, wind, etc.?
- EPA-11 | Page 3-58 states that "currently, the beach fringe is an effective travel corridor for old-growth dependent species; however, possible future harvest on state lands near the mouth of Mill Creek could disrupt this connectivity and, thus, the effectiveness of the beach fringe as a travel corridor". Do proposed action alternatives mitigate for this foreseeable future action? If not, can they?
- EPA-12 | The top and bottom sections of Table 3-24 on 3-72 both read "25 Years After Project". One should read "Immediately After Project".

SUMMARY OF RATING DEFINITIONS  
AND FOLLOW-UP ACTION\*

Environmental Impact of the Action

**LO--Lack of Objections**

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

**EC--Environmental Concerns**

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

**EO--Environmental Objections**

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

**EU--Environmentally Unsatisfactory**

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

**Category 1--Adequate**

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

**Category 2--Insufficient Information**

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

**Category 3--Inadequate**

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

\*From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment.

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## **Letter 13 - Environmental Protection Agency (EPA)**

### **Forest Service Response**

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#### **Forest Service Response to EPA-1**

Your comments and recommendations regarding reconciling proposals to build new roads in the Madan area when the Forest Service web site states that it only receives 20 percent of the funds it needs to maintain existing roads and has an \$8.4 billion maintenance and reconstruction backlog are noted. We believe that the EIS does explain how the new roads would be maintained or put in storage, presents alternatives for maintenance or storage of the new roads, and includes alternatives that do not involve significant road building. Congress has recognized the need for additional road maintenance. After steady decreases in road maintenance funding during the early 1990s, road maintenance has showed steady increases for the last four years. Additionally, Congress appropriated \$50 million to the Forest Service in FY 2001 for deferred maintenance needs (Title 8, PL 106-291). The same legislation authorized the continuation of a program to address deferred road maintenance for FY 2002 through 2006. While the Forest Service cannot predict the actions of future legislation, there is a reasonable expectation that the Madan road prescriptions can be met.

#### **Forest Service Response to EPA-2**

Your recommendation that roads be decommissioned after the sale is noted. You are correct in assuming that there is an error on page 2-15 of the Draft EIS. The Final EIS has been corrected to state that the cost of road maintenance over a 30-year period under Option A would be similar to the cost of closing roads at the termination of the sale under Option B.

#### **Forest Service Response to EPA-3**

The terms decommissioning, road storage, and stormproofing are defined in the text box at the beginning of Chapter 2 of the Final EIS. We have also attempted to clarify their use in the Final EIS.

#### **Forest Service Response to EPA-4**

Your comment that it appears from the road cards that there are many opportunities to relocate roads in order to avoid impacts to wetlands is noted. There may be opportunities during final road layout to avoid impacting some wetlands (see COE-RT-10 through 12). These will be explored. However, the topographic lines and the wetland mapping shown on the road card maps do not have sufficient detail to make this determination. The current road proposals are based on site-specific field information gained during the preliminary road layout. Also see our response to comment USDI-16.

#### **Forest Service Response to EPA-5**

Your recommendation that the Final EIS include the economic analysis that lead to eliminating the LTF-barge only alternative is noted. The Final EIS has been modified to provide for either LTF to water or LTF to barge options. We do not believe that an economic analysis of the LTF to barge only alternative is needed.

#### **Forest Service Response to EPA-6**

Your recommendation that the Forest Service place hardened, impervious surfaces under all permanent LTFs to capture petroleum products in case of a spill by future (non-Forest Service) users of the sites is noted. Installing impervious surfaces within the sub-grade of this LTF would be cost prohibitive. Furthermore, LTF design features, appropriate BMPs, including mitigation measures as well as timber contract provisions associated with the prevention of oil spills affords adequate protection measures in the event of an oil spill. Addressing all permanent LTFs within this analysis and decision would be outside of the scope of the project. Recommending or requiring the hardening of all permanent LTF is beyond the scope of this document. The concern for spills needs to be applied for this proposed action, not actions 30 years in the future.

#### **Forest Service Response to EPA-7**

Your recommendation that we consult with the National Marine Fisheries Service (NMFS) about potential impacts of LTFs to essential Fish Habitat is noted and has been implemented for this project. See the Essential Fish Habitat report in Chapter 3, Watershed and Fish Resources. The National Marine Fisheries



Service (NMFS) is included in the Madan consultation distribution list. We had direct consultation with NMFS and they concurred with our "No Effect" determination.

Both of the LTF sites proposed for development meet Forest Plan Appendix G guidelines and were determined to be suitable by the US Fish and Wildlife Service. All of the dive reports are available in the planning file. The current was noted along the first 70 meters of the 100-meter transect surveyed during the dive at Moose Creek LTF site. The water depth at the end of the transect was 25.9 meters. The diver noted that the bottom slope would have been steeper (with a deeper end point) if the transect had been surveyed perpendicular to the shoreline or toward the mouth of Moose Creek.

#### **Forest Service Response to EPA-8**

Removal of prescribed percentages of volume would create openings. These openings would be spread throughout the unit and the size of the openings would be determined by the diameter and distribution of trees growing in the unit. While the prescriptions are designed to meet different objectives, the prescriptions with the highest retention would mimic small natural disturbance patterns. Within openings, the trees selected would have the greatest value. Trees being retained would be those of low quality, high defect that best meet the needs of wildlife. This type of harvest is being used to meet all the resource concerns and provide a viable timber sale. Multiple use management is being implemented.

#### **Forest Service Response to EPA-9**

Your recommendation that effects on moose habitat be included in the Final EIS is noted. The Draft EIS identified the fact that moose and other species are addressed in the Wildlife Resource Report (Griffin, 1999) for the project. A summary for this species has been included in Chapter 3 of the Final EIS.

#### **Forest Service Response to EPA-10.**

Your request for information on regeneration potential and the time necessary for a stand to reach maturity is noted. The harvest of trees starts the stand management process. After harvest, regeneration normally starts immediately and continues until the growing space is fully occupied. The growing space can be used by trees, shrubs, or herbaceous plants. Creating larger openings and disturbing the soil favors Sitka spruce regeneration. Western hemlock and western redcedar are more shade-tolerant than Sitka Spruce and Alaska yellow cedar and will be more abundant in areas with less canopy disturbance. The more sunlight that reaches the ground the better the growing conditions and the greater amount of Sitka spruce. Under intensive management on productive sites a 90-foot tall tree can be produced in 50 to 60 years. DBH would range between 9 and 17 inches, depending on site quality and tree spacing. Without management, it can take 200 years for a western hemlock to reach 22 inches in diameter. Defect, especially in western hemlock increases with age. From numerous sales of unmanaged stands the defect is typically from 30-50%. Defect in managed stands is expected to be low. For the Rynda Island sales that harvested stands approximately 180 years old, the defect was less than 5%.

#### **Forest Service Response to EPA-11**

At present, the state has no plans to harvest in the beach fringe on state lands near the mouth of Mill Creek; thus, this harvest is not reasonably foreseeable. If the state does harvest in this area, a portion of the corridor may be lost. Stream corridors and the expanded Virginia Lake Old Growth Reserve would partially mitigate for this loss of habitat. Also, it is unlikely that the state would harvest without regard to maintaining travel corridors.

#### **Forest Service Response to EPA-12**

You are correct that the top of Table 3-24 in the Draft EIS (Table 3-27 of the Final EIS) should say "immediately after project" not "25 years after project". This has been corrected in the Final EIS.

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

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USDA Forest Service  
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